COLLABORATIVE STUDY ON HIGH RISK PREGNANCIES AND MATERNAL MORTALITY

(INSTITUTION BASED)

AN ICMR TASK FORCE STUDY

INDIAN COUNCIL OF MEDICAL RESEARCH
NEW DELHI
1990

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P R E F A C E

This study was a joint ICMR-UNICEF venture to determine the magnitude of socio-demographic and obstetric factors as potential risk of adverse maternal or foetal outcome. Most developed countries have perinatal mortality rate as an indicator of efficiency of obstetric services. However, in our country, even the maternal mortality is still very significant. Low socio-economic standards, ineffective management and lack of obstetric services are responsible factors for the high maternal and perinatal mortality in the community. We have not been able to bring down the maternal deaths to only the inevitable deaths.

The health problems of mothers and newborns arise from the synergistic effects of malnutrition, poor, unhygienic living conditions, infections and unregulated fertility. Bad communication and transport, illiteracy and ineffective public health services lead to inadequate obstetric care. This study was initiated to understand the causes of maternal morbidity and mortality, and the extent to which the existing socio-demographic and obstetric factors play a role. This report may guide us to improve our antenatal, intranatal and postnatal care. The objective therefore is to identify the risk factors especially in the hospital set-up of our country, so that appropriate care is made available for these patients.

Details of hospital admissions and deliveries, abortions with special emphasis on septic abortions, perinatal outcome in relation to various medical problems such as hypertensive disorders of pregnancy and obstetric complications during pregnancy have been studied. As premature labour and low birth weight contribute very significantly to perinatal mortality, greater emphasis have been given to study their demographic profile.

Anaemia, abortion problems, hypertensive disorders, premature labour, etc. are the common problems found in women admitted to the apex hospitals for delivery. About 26 per cent of babies born in these hospitals are of low birth weight. The causes of maternal deaths in these institutes and the socio-demographic factors associated with these deaths have been

studied. A close look at this study will therefore make the institutions and obstetricians aware of our strengths and lapses and focus our attention on specific high risk factors associated with pregnancy loss which are more applicable and important in our country. The discussion at the end of each chapter highlights the important factors influencing maternal and perinatal outcome.

Badri Nath Saxena.

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Senior Deputy Director General

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INTRODUCTION

Women exposed to multiple problems of social, biological and pathological origin have the highest risk of perinatal loss. Unfortunately the mothers who have the highest cumulative risk are likely to receive the poorest medical care. No amount of technical expertise will help a woman who cannot or will not accept it[1].

It is important to emphasise that the maternal and child health services as they exist today require strengthening. Efforts to improve both the quality and quantity of these services have received considerable attention from the Government in recent years owing to the recognition of its importance for success of the family welfare programme. To accelerate the development of maternity care in developing countries, health care providers need to know the characteristics of the patients they serve and the risks associated with those characteristics. There are a number of hospitals providing specialised maternity and child health services at the tertiary level. A large number of pregnant women come to these hospitals for delivery (either registered in antenatal period or unbooked) and postnatal care. Information on the characteristics of the women attending these hospitals, the nature and incidence of obstetrical complications on a nation-wide basis is not available.

Complications of pregnancy like antepartum haemorrhage hypertensive disorders etc. are associated with high maternal and foetal morbidity and mortality. A maternal death is not only the loss of one woman but also affects the survival of the children she leaves behind. A high maternal mortality rate therefore, apart from reflecting the state of health facilities, status of women etc. also indirectly affects the health of the children.

In the developing countries, the main cause of death in females of reproductive age is child birth. When maternal mortalities of less than 10/100,000 deliveries are recorded in the West, the figures in our country are still in the range of 400 to 700/100,000. In India the maternal mortality rate has been reported to be between 5 to 7.53 per 1000 deliveries as compared to 0.04 per 1000 in Sweden and 0.02 per 1000 in Canada[2,3]. The main causes of maternal mortality are septic abortions, haemorrhage, toxaemia, puerperal sepsis and malpresentation of the foetus.

The perinatal mortality in India is very high. The commonest causes of deaths in the perinatal period are low birth weight and respiratory disorders. Knowledge of factors associated with low birth weight is essential for effective management during pregnancy, labour as well as in the perinatal period. A large proportion of the low birth weight babies are due to premature deliveries. Premature deliveries contribute to a very high proportion of still births and perinatal deaths. The present study aims at studying the characteristics of patients served by large medical institutions in different parts of the country to help provide information on reproductive histories of women attending general hospitals, provide information on selected antenatal conditions like, PET, prematurity, APH etc. and their association to pregnancy outcome as well as information on delivery procedures, maternal mortality and perinatal mortality. This study also provides the demographic socio-economic and obstetric parameters associated with some of the major complications of pregnancy. Though there are number of studies on the techniques, management and sequelae of induced abortions, there is hardly any study on the prevalence of spontaneous and septic abortions in India and the demographic and socio-economic characteristics of these patients. Some information has also been obtained on the factors associated with spontaneous abortions.

MATERIALS AND METHODS

The study was carried out at 10 teaching hospitals situated in various parts of the country. Study sample comprised of women admitted to these hospitals over a period of one year for reasons pertaining to pregnancy including complications of abortions (excluding medical termination of pregnancies at the same hospital). Hospitals included in the study were: (1)Baroda, Medical College and SSG Hospital; (2) Bombay, King Edward Memorial Hospital; (3) Bombay, Nowrosji Wadia Maternity Hospital; (4) Calcutta, Eden Hospital; (5) Calcutta, Rama Krishna Seva Pratishthan; (6) Jamshedpur, Tata Hospital; (7) Madras, Institute of Obstetrics and Gynaecology; (8) New Delhi, All India Institute of Medical Sciences; (9) Trivandrum, SAT Hospital; and (10) Varanasi, Institute of Medical Sciences, Banaras Hindu University.

Study protocol and data recording forms were prepared centrally. Uniform methodology and schedules were used for collection of information by all participating centres.

A total of 43550 pregnant women from the above ten hospitals were enrolled amounting to 45680 hospital admissions, as many women required admission during the antenatal period and had come back for delivery. Number of cases registered for the study varied from hospital to hospital (Table 1.01). Information was gathered on demographic characteristics, complete obstetric history, details of current pregnancy, complications, reasons for admission and outcome of pregnancy when available.

Data analysis comprises of several sections. All women registered for study including antenatal admissions and admissions for complications of abortions in addition to delivery cases were considered as one sample. First part of report includes analysis of this sample for demographic and obstetric profile of women seeking hospital admission. Reasons for hospital admissions were obtained considering each admission as a unit for analysis. All data was analysed centrewise.

Abortions were taken separately as a sub sample for analysis. Centrewise analysis giving demographic and obstetric profile was performed. Of the women who were admitted during antenatal period, many did not return to the hospital for delivery. All

women who delivered in the participating centres were taken as one sample. Data available on this group of women has been analysed in great detail including, in addition to demographic and obstetric profile, outcome of pregnancy, mode of delivery, status of mother and child at discharge. Perinatal outcome and birth weight has been analysed in relation to demographic and obstetric parameters.

Major complications of pregnancy including APH, hypertensive disorders, premature labour, have been analysed separately studying association of demographic and obstetric factors on outcome including birth weight and status of mother and infant at discharge. Deliveries resulting in low birth weight babies have also been analysed and compared with the total deliveries to study the association of various factors which could lead to low birth weight babies.

CHARACTERISTICS OF STUDY POPULATION

DEMOGRAPHIC PROFILE

All the participating hospitals were situated in major cities. As they are apex institutes with many facilities, these hospitals also drew their clientele from nearby towns and villages besides catering to people in their cities. Type of clientele that these hospitals are catering to varied from centre to centre as some of these are referral hospitals. Demographic and obstetric profile of study population has been presented centrewise.

Place of residence

In cities such as Bombay, majority of the patients had come from the city. At Jamshedpur, Tata Hospital 60.9 per cent women came from nearby town. At Trivandrum 48.2 per cent women who came to the hospital were from rural areas. Although this is an institution based study percentage of women coming from rural areas varied from 0.4 in KEM, Bombay to 48.2 per cent in Trivandrum. On the whole 76.5 percent of cases were from the cities and 23.4 percent from nearby towns and villages (Table 1.02).

Religion

On the whole 89.3 percent women came from Hindu families, which varied from 79.3 percent at Trivandrum to 97.9 at one of the hospitals at Calcutta. The two centres at Calcutta provided minimum (1.3%) and maximum proportion (12.3%) of Muslim women for this study. Christian women were mainly from Trivandrum (8.8%) and Madras (7.5%). Sikhs comprised 0.8 percent of total study population and 0.5 percent belonged to other religions (Table 1.03).

Type of family

More than 52 percent women came from joint families. Percentage of joint families varied from 33.6 percent at Madras to 66.8 percent at Varanasi (Table 1.04).

Age

Average age of women varied from 23.5±4.2 years at RKM Hospital, Calcutta to 26.1±4.2 years at All India Institute of Medical Sciences, New Delhi giving an overall average of 24.2±4.3 years. Maximum number of young pregnant women (<20 years) were reported by the Madras centre (15.8%) followed by Eden Hospital, Calcutta (14.3%). Pregnancies in this age group were minimum at New Delhi. On the whole 10.3 percent of the pregnancies were in women below 20 years of age of which 0.7 percent were in girls below 17 years of age. Majority of the pregnancies (86.9%) were in women 20-34 years of age and only 2.8 percent of the pregnant women were of age 35 years or above (Table 1.05).

Literacy

Literacy plays a significant role in perception of problems and importance of seeking timely care during pregnancy. In this study literacy rate was observed to be lowest among women at Baroda (50.1%) and highest at Trivandrum (92.8%). Overall literacy rate was 75.1 percent. At Delhi Centre literacy rate of 82.7 percent though lower than that at Trivandrum, had maximum women with higher education beyond school level. From Delhi centre 43.4 percent women had education upto graduate or higher level as compared to six percent at Trivandrum. Only one to two percent women had higher education at Baroda, Bombay and Madras (Table 1.06). The literacy rate of husbands was more than 90 percent. This varied from about 82.1 percent at Madras to almost 95.8 percent at R.K. Mission Hospital, Calcutta. At the other hospital from Calcutta literacy rate was lower (90.9%), which was also true for study women from these two hospitals. On the whole 24.9 percent of husbands had higher education in college (Table 1.07).

Occupation

Most of the women were housewives. Percentage of women working outside the home varied from 2.2 percent at Madras to 20.2 percent at Delhi. Ten to twelve percent women were working at Baroda, Calcutta (Eden Hospital) and Trivandrum.

At the remaining centres percentage of working women was less than six. Majority of the women who were working were in service such as teaching, clerical and other office jobs, except at Baroda where 8.8 percent were working as labourers and only 2.8 percent were in service. Literacy level was also lowest at Baroda. From Delhi 17.2 percent women had teaching or other jobs at offices as it was observed that more than 43 percent had college education (Table1.08). Unemployment rate among the husbands was about one to three percent at all the centres except at Varanasi, where it was 9.8 percent. Out of the total, 33.2 percent were engaged in service which varied from 8.1 percent at Madras to 54.9 percent at Delhi, 51.6 percent were labourers and 12.7 percent were self employed (business etc.) (Table 1.09).

Habits

Information regarding consumption of alcohol or tobacco products during pregnancy or just prior to conception was also collected. Percentage of women consuming alcohol was almost negligible (0.2%). Tobacco chewing or smoking was reported by 15.5 percent of women coming to KEM hospital, Bombay. Other centres reporting about six to eight percent users of tobacco were NWM, Bombay, RKM, Calcutta and Madras (Table 1.10).

OBSTETRIC PROFILE

Age at marriage

Average age at marriage varied from 16.5 years at Varanasi where 54.8 percent of women had married before completing 17 years, to 20.8 years at Trivandrum. Overall average age at marriage was observed to be 19.4 years with standard deviation of 3.4 years. On the whole 16.3 percent were reported to have married before 17 years of age (Table 1.11).

Number of previous pregnancies

Majority of the women (85.7%) had less than three pregnancies. On the whole 41.1 percent women were primigravida ranging from 29.1 percent at KEM hospital, Bombay to 51.7 percent at R.K.Mission Hospital, Calcutta. Average number of pregnancies per woman ranged from 0.9 to 1.6 giving an overall average of 1.2 pregnancies per woman (Table 1.12).

History of abortion

There was history of previous spontaneous abortion in only 10.4 percent women. Maximum number of spontaneous abortions (0.5 per woman) were reported by AIIMS, New Delhi, which was almost one third of the average pregnancies (1.6 per woman). Spontaneous abortions ranged from 0.09 to 0.5 per woman giving an overall average of 0.16 abortions per woman (Table 1.13).

Two percent of the women gave history of previous induced abortion, 1.7 percent had one induced abortion and 0.3 percent reported to have had more than one. Average number of induced abortions per woman was observed as 0.02. Maximum number of induced abortions, (0.09) per woman were reported at AIIMS, New Delhi (Table 1.14).

Previous perinatal/neonatal mortality

Three percent of the total women gave history of one still birth and 0.7 percent of more than one still birth. This gave an average of 0.04 still births per woman (Table 1.15) In addition 4.5 percent women reported loss of babies during neonatal period. One neonatal death was reported by 3.7 percent and more than one neonatal death by 0.8 percent women. This gave an average of 0.05 neonatal deaths per woman (Table 1.16) Again maximum number of still births (0.10 per woman) and neonatal deaths (0.12 per woman) were reported at AIIMS, New Delhi. This institute registers only primigravidae and high risk cases for antenatal care or delivery.

Previous use of contraceptives

Use of contraceptives prior to this conception was reported by 11.9 percent women only. Fifty two (0.1%) women or their husbands had failure of sterilization. This included 33 cases of tubectomy and 19 cases of vasectomy. Intrauterine devices had been used by 504 (1.2%) women and 10.6 percent women reported to have used other conventional contraceptives(Table 1.17). Current pregnancy was reported to be due to contraceptive failure in 537 women (10.4%) out of a total of 5183 users. This included

22 (4.4%) cases of pregnancy due to failure of intrauterine device out of a total of 504 users of the device. Remaining 463 (10.0%) were reported from 4627 users of other contraceptives.

INTERVAL SINCE LAST PREGNANCY

For 41.1 percent of the women this was the first pregnancy. From the remaining, 3.6 percent had conceived within six months of outcome of last pregnancy and another 9.8 percent before one year. There were 51.7 percent women for whom last pregnancy outcome to this conception period was over 2 years. Variation from centre to centre was observed. There were comparatively more women with shorter inter pregnancy interval from centres like New Delhi, Jamshedpur, Trivandrum and Eden Hospital, Calcutta (Table 1.18).

Outcome of last pregnancy

Outcome of last pregnancy was abortion in 15.2 percent which is higher than abortion rate of 9.5 percent observed in this series of pregnancies (discussed later in this report). This is probably because previous abortion being a risk factor more women from this group tend to seek hospital care. Similar findings were observed for still births also. Though outcome of pregnancy was still birth in 3.8 percent, excluding abortions it works out to be 4.4 percent as compared to 3.7 percent in this series (Table 1.19). Another observation is that the centres which showed larger percentage of women with abortion as outcome of last pregnancy also showed shorter inter pregnancy interval.

DISCUSSION

This is one of the largest studies on hospital admissions conducted in India. Estimates and inferences drawn from hospital statistics have limited value and are difficult to generalise. However, such statistics enable us to know the characteristics of the patients who attend the hospitals and also help us to identify the risks associated with some of the obstetric complications. The large number of cases registered in this study provide sufficient numbers to study a variety of complications.

Though the study was conducted in teaching hospitals situated in cities about 20 percent of women came from nearby towns and villages.

Maternal age has an important bearing on the incidence of anaemia and premature labour, low birth weight and mortality rates[4,5]. It has also been reported that very young mothers aged 16-20 years and mothers between 35-45 years have increased risk of having a mentally retarded child[6]. The women in this study were mostly in the 20-34 years age group. Banaras (1.0%) and Eden Hospital, Calcutta (1.6%) had a higher proportion of women under 16 years of age as compared to other centres. Madras (15.1%), Eden Hospital, Calcutta (12.7%) and Jamshedpur (10.8%) had more women in the 16-19 years age group. The association of age with complications and outcome of pregnancy are discussed elsewhere in this report.

Education contributes towards better health. Women's education is especially important to help reduce both maternal and perinatal mortality. Education also helps women to realise their right to health facilities. This fact is borne out from this study where literacy rate among women who attended hospitals was 75.1 percent as compared to the overall national female literacy rate of 47.8 percent in urban areas[7]. Similar findings have been reported in another multicentre hospital based study[8]. The literacy rate of husbands of women attending these hospitals was 90.3 percent as compared to the national urban male literacy level of 65.8 percent[7]. Use of tobacco smoking has been found to be associated with increased incidence of low birth weight babies[9]. In this study, tobacco chewing was reported by 15.5 percent of women coming to KEM Hospital, Bombay. Other centres like NWM Bombay, R.K. Mission, Calcutta and Madras reported 6 to 8 percent use of tobacco.

The age at marriage at various centres varied from 16.5 years to 20.8 years. Average age at marriage was 19.4 years as compared to 18.3 years for all India[7]. The difference could be attributed largely to the urban, educated sample of this study. The average number of pregnancies in this study ranged from 0.9 to 1.6 giving an overall average of 1.2 pregnancies per woman (excluding the current pregnancy).

A new born baby has optimum opportunity for physical and intellectual growth when there is a planned and wanted pregnancy. Data on previous use of contraceptives indicates that only 11.9 percent women used contraceptives. The current pregnancy was due to contraceptive failure in 537 women (10.4%) out of a total of 5183 users. This included 33 cases of tubectomy and 19 cases of vasectomy. Clinicians should perform these operations very meticulously to prevent such failures as they disrupt the faith of the patients in the family welfare programme.

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TABLE 1.01:TOTAL NO. OF WOMEN REGISTERED AND HOSPITAL ADMISSIONS

CENTRE	TOTAL NO. OF WOMEN	NO.OF HOSPITAL ADMISSIONS	ADMISSIONS/ WOMAN
Baroda	4244	4317	1.02
Bombay(KEM)	4193	4364	1.04
Bombay(NWM)	3630	3916	1.08
Calcutta(Eden)	5551	5609	1.01
Calcutta(RKM)	6883	7414	1.08
Jamshedpur	3542	3634	1.03
Madras	5752	5815	1.01
New Delhi	2744	3126	1.14
Trivandrum	4859	5274	1.08
Varanasi	2152	2211	1.03
Total	43550	45680	1.05

TABLE 1.02: RESIDENCE

Centre	City		City slum		Town		Rural/Village		N.K.	Total
	No.	%	No.	%	No.	%	No.	%		
Baroda	2809	66.5	254	6.0	39	0.9	1124	26.6	18	4244
Bombay(KEM)	3951	94.4	211	5.0	5	0.1	18	0.4	8	4193
Bombay(NWM)	3024	83.4	533	14.7	21	0.6	48	1.3	4	3630
Calcutta(Eden)	3988	72.0	437	7.9	775	14.0	339	6.1	12	5551
Calcutta(RKM)	5540	80.6	639	9.3	426	6.2	267	3.9	11	6883
Jamshedpur	1153	32.7	101	2.9	2154	60.9	124	3.5	10	3542
Madras	1899	33.1	3284	57.1	20	0.3	547	9.5	2	5752
New Delhi	2393	87.5	59	2.2	92	3.3	192	7.0	8	2744
Trivandrum	1481	30.5	164	3.4	870	17.9	2340	48.2	4	4859
Varanasi	1234	58.0	96	4.5	85	4.0	714	33.5	23	2152
Total	27472	63.2	5778	13.3	4487	10.3	5713	13.1	102	43550

Percentages are row percentages

TABLE1.03: RELIGION

Centre	Hindu		Muslim		Christian		Sikh		Others		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	
Baroda	3899	91.9	308	7.3	14	0.3	9	0.2	14	0.2	4244
Bombay(KEM)	3767	89.8	339	8.1	52	1.2	2	0.1	33	0.8	4193
Bombay(NWM)	3348	92.2	185	5.1	60	1.7	4	0.1	33	0.9	3630
Calcutta(Eden)	4812	86.6	684	12.3	18	0.3	8	0.1	29	0.7	5551
Calcutta(RKM)	6736	97.9	92	1.3	12	0.2	29	0.4	14	0.2	6883
Jamshedpur	2939	83.0	393	11.1	53	1.5	125	3.6	32	0.8	3542
Madras	5071	88.2	247	4.3	432	7.5	-	-	2	-	5752
New Delhi	2450	89.3	48	1.8	53	1.9	153	5.6	40	1.4	2744
Trivandrum	3855	79.3	572	11.8	428	8.8	1	-	3	0.1	4859
Varanasi	2040	94.8	89	4.1	9	0.4	8	0.4	6	0.3	2152
Total	38917	89.3	2957	6.8	1131	2.6	339	0.8	206	0.5	43550

Percentages are row percentages

TABLE 1.04: TYPE OF FAMILY

Centre	Nuclear		Joint		N.K.	Total
	No.	%	No.	%		
Baroda	2107	50.3	2085	49.7	52	4244
Bombay(KEM)	1823	44.1	2312	55.9	58	4193
Bombay(NWM)	1832	50.9	1740	49.1	58	3630
Calcutta(Eden)	2896	52.5	2616	47.5	39	5551
Calcutta(RKM)	2433	35.5	4415	64.5	35	6883
Jamshedpur	1436	41.1	2062	58.9	44	3542
Madras	3793	66.4	1918	33.6	41	5752
New Delhi	1410	51.6	1320	48.4	14	2744
Trivandrum	2105	43.4	2746	56.6	8	4859
Varanasi	709	33.2	1426	66.8	17	2152
Total	20544	47.5	22640	52.5	366	43550

Percentages are row percentages

TABLE 1.05: AGE (YEARS)

Centre	No. ≤16	%	No. 17-19	%	No. 20-34	%	No. ≥35	%	N.K.	Total	Mean±S.D. (Yrs.)
Baroda	9	0.2	259	6.1	3828	90.3	145	3.4	3	4244	24.4±4.4
Bombay(KEM)	27	0.6	389	9.3	3614	86.2	162	3.9	1	4193	24.3±4.4
Bombay(NWM)	8	0.2	303	8.4	3262	89.9	55	1.5	2	3630	23.6±3.9
Calcutta(Eden)	90	1.6	703	12.7	4657	84.0	97	1.7	4	5551	24.7±4.3
Calcutta(RKM)	62	0.9	594	8.6	6053	88.0	170	2.5	4	6883	23.5±4.2
Jamshedpur	17	0.5	383	10.8	3042	86.1	93	2.7	7	3542	24.0±4.4
Madras	38	0.7	870	15.1	4686	81.5	157	2.7	1	5752	23.8±4.5
New Delhi	7	0.3	69	2.5	2563	93.5	101	3.7	4	2744	26.1±4.2
Trivandrum	11	0.2	420	8.7	4295	88.4	131	2.7	2	4859	24.6±4.3
Varanasi	22	1.0	193	9.0	1808	84.0	129	6.0	-	2152	25.1±4.9
Total	291	0.7	4183	9.6	37808	86.9	1240	2.8	28	43550	24.2±4.3

Percentages are row percentages

TABLE 1.06: EDUCATION (WIFE)

Centre	Nil		Primary		Higher School		College or above		Total	Literacy Rate
	No.	%	No.	%	No.	%	No.	%		%
Baroda	2120	49.9	1547	36.5	517	12.2	60	1.4	4244	50.1
Bombay(KEM)	1395	33.2	1503	35.9	1243	29.7	52	1.2	4193	66.8
Bombay (NWM)	726	20.0	1085	29.9	1761	48.5	58	1.6	3630	80.0
Calcutta(Eden)	1414	25.5	1094	19.7	2250	40.5	793	14.3	5551	74.5
Calcutta(RKM)	999	14.5	1179	17.1	3284	47.9	1421	20.5	6883	85.5
Jamshedpur	871	24.7	1273	36.0	959	27.0	439	12.3	3542	75.3
Madras	1757	30.5	2447	42.6	1491	25.9	57	1.0	5752	69.5
New Delhi	474	17.3	247	8.9	832	30.3	1191	43.4	2744	82.7
Trivandrum	352	7.2	1772	36.5	2442	50.3	293	6.0	4859	92.8
Varanasi	723	33.6	346	16.1	692	32.1	391	18.2	2152	66.4
Total	10831	24.9	12493	28.6	15471	35.5	4755	10.9	43550	75.1

Percentages are row percentages

TABLE 1.07: EDUCATION (HUSBAND)

Centre	Nil		Primary		Higher School		College or above		Total	Literacy Rate %
	No.	%	No.	%	No.	%	No.	%		
Baroda	674	15.8	1993	47.0	1439	34.0	138	3.3	4244	84.2
Bombay (KEM)	489	11.6	1731	41.3	1881	44.8	92	2.2	4193	88.4
Bombay (NWM)	214	5.9	495	13.6	2685	74.0	236	6.5	3630	94.1
Calcutta (Eden)	506	9.1	871	15.7	1769	31.9	2405	43.3	5551	90.9
Calcutta (RKM)	286	4.2	774	11.2	2216	32.2	3607	52.4	3883	95.8
Jamshedpur	284	7.9	349	9.9	1607	45.3	1302	36.9	3542	92.1
Madras	1029	17.9	1447	25.2	3102	53.9	174	3.0	5752	82.1
New Delhi	150	5.5	142	5.2	951	34.6	1501	54.7	2744	94.5
Trivandrum	330	6.8	1444	29.7	2737	56.3	348	7.1	4859	93.2
Varanasi	273	12.7	142	6.6	711	33.1	1026	47.6	2152	87.3
Total	4235	9.7	9388	21.6	19098	43.9	10829	24.9	43550	90.3

Percentages are row percentages

TABLE 1.08: OCCUPATION (WIFE)

Centre	Labourer		Service		Self Employed		Housewives		Total
	No.	%	No.	%	No.	%	No.	%	
Baroda	372	8.8	117	2.8	7	0.1	3748	88.3	4244
Bombay (KEM)	34	0.8	158	3.7	11	0.3	3990	95.2	4193
Bombay (NWM)	63	1.7	105	3.0	4	0.1	3458	95.3	3630
Calcutta (Eden)	149	2.7	484	8.8	41	0.7	4877	87.9	5551
Calcutta (RKM)	29	0.4	368	5.3	8	0.1	6478	94.1	6883
Jamshedpur	24	0.7	83	2.4	5	0.1	3430	96.8	3542
Madras	53	0.9	72	1.3	1	(-)	5626	97.8	5752
New Delhi	66	2.4	472	17.2	16	0.6	2190	79.8	2744
Trivandrum	245	5.0	254	5.2	6	0.2	4354	89.6	4859
Varanasi	4	0.2	52	2.5	5	0.2	2091	97.2	2152
Total	1039	2.4	2165	5.0	104	0.2	40242	92.4	43550

Percentages are row percentages

TABLE 1.09: OCCUPATION (HUSBAND)

Centre	Labourer		Service		Self Employed		Unemployed		Total
	No.	%	No.	%	No.	%	No.	%	
Baroda	3004	70.8	949	22.4	209	4.9	82	1.9	4244
Bombay (KEM)	1773	42.3	2078	49.6	250	6.0	92	2.2	4193
Bombay (NWM)	2661	73.3	856	23.5	63	1.8	50	1.4	3630
Calcutta (Eden)	1710	30.8	2416	43.6	1379	24.8	46	0.9	5551
Calcutta (RKM)	1704	24.8	3587	52.1	1395	20.2	197	2.9	6883
Jamshedpur	2054	58.0	935	26.4	460	13.0	93	2.6	3542
Madras	5005	87.0	463	8.1	192	3.3	92	1.6	5752
New Delhi	792	28.9	1506	54.9	354	12.9	92	3.3	2744
Trivandrum	3471	61.4	762	15.6	506	10.4	120	2.4	4859
Varanasi	305	14.1	908	42.2	729	33.9	210	9.8	2152
Total	22479	51.6	14460	33.2	5537	12.7	1074	2.5	43550

Percentages are row percentages

TABLE 1.10: CONSUMPTION OF ALCOHOL/TOBACCO

Centre	Alcohol	Tobacco		Both	None		Total
	No.	No.	%		No.	%	
Baroda	2	89	2.2	2	4151	97.8	4244
Bombay (KEM)	2	650	15.5	-	3541	84.5	4193
Bombay (NWM)	1	221	6.1	-	3408	93.9	3630
Calcutta (Eden)	7	197	3.5	6	5341	96.2	5551
Calcutta (RKM)	2	486	7.1	1	6394	92.9	6883
Jamshedpur	13	150	4.2	38	3341	94.3	3542
Madras	-	441	7.7	-	5311	92.3	5752
New Delhi	2	28	1.0	4	2710	98.8	2744
Trivandrum	1	17	0.3	1	4840	99.6	4859
Varanasi	1	18	0.8	-	2133	99.1	2152
Total	31	2297	5.3	52	41170	94.5	43550

Percentages are row percentages

TABLE 1.11: AGE AT MARRIAGE

Centre	≤16 No.	%	17-19 No.	%	20-24 No.	%	≥25 No.	%	N.K.	Total	Mean±S.D.
Baroda	605	14.3	2925	69.1	659	15.6	46	1,1	9	4244	18.1±2.3
Bombay (KEM)	1192	28.4	1692	40.4	1127	26.9	182	4.3	-	4193	18.2±3.7
Bombay (NWM)	444	12.2	1594	43.9	1396	38.5	195	5.4	1	3630	19.3±3.1
Calcutta (Eden)	419	7.6	2178	39.3	2454	44.3	498	9.0	2	5551	20.2±3.2
Calcutta (RKM)	962	14.0	1920	27.9	2999	43.6	1001	14.5	1	6883	20.5±3.9
Jamshedpur	667	18.8	1177	33.3	1421	40.2	273	7.7	4	3542	19.4±3.6
Madras	839	14.6	2683	46.7	2001	34.8	228	3.9	1	5752	19.0±2.9
New Delhi	497	18.1	611	22.3	1262	46.0	374	13.6	-	2744	20.1±4.9
Trivandrum	297	6.1	1613	33.2	2244	46.2	704	14.5	1	4859	20.8±3.8
Varanasi	1180	54.8	556	25.9	369	17.2	46	2.1	1	2152	16.5±3.6
Total	7102	16.3	16949	38.9	15932	36.6	3547	8.2	20	43550	19.4±3.4

Percentages are row percentages

TABLE 1.12: NO. OF PREVIOUS PREGNANCIES

Centre	0 No.	0 %	1-2 No.	1-2 %	3-5 No.	3-5 %	>5 No.	>5 %	Total	Average/ woman
Baroda	1502	35.4	1867	44.0	793	18.7	82	1.9	4244	1.4
Bombay (KEM)	1220	29.1	2284	54.5	643	15.3	46	1.1	4193	1.4
Bombay (NWM)	1592	43.9	1724	47.5	292	8.0	22	0.6	3630	1.0
Calcutta (Eden)	2730	49.2	2234	40.2	545	9.8	42	0.8	5551	1.0
Calcutta (RKM)	3557	51.7	2724	39.8	577	8.4	25	0.4	6883	0.9
Jamshedpur	1664	47.0	1399	39.5	437	12.3	42	1.2	3542	1.1
Madras	2162	37.6	2684	46.7	851	14.8	55	0.9	5752	1.2
New Delhi	816	29.8	1232	44.9	633	23.0	63	2.3	2744	1.6
Trivandrum	1925	39.6	2399	49.4	482	9.9	53	1.1	4859	1.1
Varanasi	726	33.7	875	40.7	481	22.4	70	3.3	2152	1.6
Total	17894	41.1	19422	44.6	5734	13.2	500	1.1	43550	1.2

Percentages are row percentages

TABLE 1.13: HISTORY OF SPONTANEOUS ABORTIONS

Centre	Nil		One		Two or more		Total	Average/Woman
	No.	%	No.	%	No.	%		
Baroda	3911	92.2	248	5.8	85	2.0	4244	0.11
Bombay (KEM)	3718	88.7	338	8.1	137	3.3	4193	0.16
Bombay (NWM)	3313	91.3	214	5.9	103	2.8	3630	0.13
Calcutta (Eden)	4994	89.6	340	6.1	237	4.3	5551	0.20
Calcutta (RKM)	6410	93.1	372	5.4	101	1.5	6883	0.09
Jamshedpur	3180	89.8	279	7.9	83	2.3	3542	0.14
Madras	5380	93.5	269	4.7	103	1.8	5752	0.09
New Delhi	1982	72.2	442	16.1	320	11.7	2744	0.50
Trivandrum	4181	86.1	482	9.9	196	4.0	4859	0.20
Varanasi	1955	90.9	125	5.8	72	3.4	2152	0.15
Total	39004	89.6	3109	7.1	1437	3.3	43550	0.16

Percentages are row percentages

TABLE 1.14: HISTORY OF INDUCED ABORTIONS

Centre	Nil		One		Two or more		Total	Average/Woman
	No.	%	No.	%	No.	%		
Baroda	4220	99.4	21	0.5	3	0.1	4244	0.01
Bombay (KEM)	4157	99.1	32	0.8	4	0.1	4193	0.01
Bombay (NWM)	3586	98.8	36	1.0	8	0.3	3630	0.01
Calcutta (Eden)	5329	96.1	208	3.7	14	0.2	5551	0.04
Calcutta (RKM)	6753	98.1	114	1.7	16	0.2	6883	0.02
Jamshedpur	3496	98.7	38	1.1	8	0.2	3542	0.02
Madras	5716	99.4	27	0.5	9	0.2	5752	0.01
New Delhi	2528	92.1	190	6.9	26	0.9	2744	0.09
Trivandrum	4782	98.4	64	1.3	13	0.2	4859	0.02
Varanasi	2126	98.8	21	1.0	5	0.2	2152	0.03
Total	42693	98.0	751	1.7	106	0.3	43550	0.02

Percentages are row percentages

TABLE 1.15: HISTORY OF STILL BIRTHS

Centre	Nil		One		Two or more		Total	Average/Woman
	No.	%	No.	%	No.	%		
Baroda	4015	94.6	189	4.5	40	0.9	4244	0.05
Bombay(KEM)	4037	96.3	126	3.0	30	0.7	4193	0.04
Bombay(NWM)	3522	97.0	79	2.2	29	0.8	3630	0.03
Calcutta(Eden)	5493	98.9	48	0.9	10	0.2	5551	0.01
Calcutta(RKM)	6749	98.1	123	1.8	11	0.1	6883	0.02
Jamshedpur	3428	96.8	95	2.7	19	0.5	3542	0.03
Madras	5558	96.6	155	2.7	39	0.6	5752	0.03
New Delhi	2473	90.1	216	7.9	55	2.0	2744	0.10
Trivandrum	4618	95.0	214	4.4	27	0.5	4859	0.05
Varanasi	2051	95.3	76	3.5	25	1.2	2152	0.05
Total	41944	96.3	1321	3.0	285	0.7	43550	0.04

Percentages are row percentages

TABLE 1.16: NEONATAL DEATHS

Centre	Nil		One		Two or more		Total	Average/Woman
	No.	%	No.	%	No.	%		
Baroda	3985	93.9	205	4.8	54	1.3	4244	0.06
Bombay(KEM)	3984	95.0	171	4.1	38	0.9	4193	0.04
Bombay(NWM)	3477	95.8	112	3.1	41	1.2	3630	0.04
Calcutta(Eden)	5464	98.4	77	1.4	10	0.2	5551	0.02
Calcutta(RKM)	6669	97.1	175	2.5	29	0.4	6883	0.03
Jamshedpur	3424	96.7	94	2.7	24	0.7	3542	0.03
Madras	5511	95.8	211	3.7	30	0.6	5752	0.04
New Delhi	2426	88.4	260	9.5	58	2.1	2744	0.12
Trivandrum	4613	94.9	210	4.3	36	0.7	4859	0.05
Varanasi	2008	93.3	114	5.3	30	1.4	2152	0.07
Total	41571	95.5	1629	3.7	350	0.8	43550	0.05

Percentages are row percentages

TABLE 1.17: CONTRACEPTIVE USED PRIOR TO THIS PREGNANCY

Centre	None		IUD		Sterilization		Others		Total
	No.	%	No.	%	No.	%	No.	%	
Baroda	4109	96.8	63	1.5	5	0.1	67	1.6	4244
Bombay(KEM)	4033	96.2	92	2.2	10	0.2	58	1.4	4193
Bombay(NWM)	3593	99.0	17	0.5	1	0.3	19	0.5	3630
Calcutta(Eden)	3440	62.0	107	1.9	2	0.4	2002	36.1	5551
Calcutta(RKM)	5153	74.8	38	0.6	6	0.1	1686	24.5	6883
Jamshedpur	3367	95.1	27	0.8	4	0.1	144	4.0	3542
Madras	5723	99.5	20	0.4	-	-	9	0.1	5752
New Delhi	2163	78.8	76	2.8	15	0.5	490	17.9	2744
Trivandrum	4765	98.1	29	0.6	7	0.1	58	1.2	4859
Varanasi	2021	93.9	35	1.6	2	0.1	94	4.4	2152
Total	38367	88.1	504	1.2	52	0.1	4627	10.6	43550

Percentages are row percentages

TABLE 1.18: INTERVAL SINCE LAST PREGNANCY(MONTHS)

Centre	≤6 No.	%	7-12 No.	%	13-24 No.	%	>24 No.	%	N.A.	Total
Baroda	100	3.6	306	11.2	1319	48.1	1017	37.1	1502	4244
Bombay(KEM)	116	3.9	279	9.4	1071	36.0	1507	50.7	1220	4193
Bombay(NWM)	46	2.3	223	10.9	835	41.0	934	45.8	1592	3630
Calcutta(Eden)	104	3.7	413	14.6	1113	39.5	1191	42.2	2730	5551
Calcutta(RKM)	87	2.6	212	6.4	941	28.3	2086	62.7	3557	6883
Jamshedpur	120	6.4	256	13.6	656	35.1	846	45.0	1664	3542
Madras	47	1.3	132	3.7	777	21.6	2634	73.4	2162	5752
New Delhi	137	7.1	283	14.7	643	33.4	865	44.9	816	2744
Trivandrum	138	4.7	351	12.0	1133	38.6	1312	44.7	1925	4859
Varanasi	34	2.4	52	3.6	458	32.1	882	61.9	726	2152
Total	929	3.6	2507	9.8	8946	34.9	13274	51.7	17894	43550

Percentages are row percentages

TABLE 1.19: OUTCOME OF LAST PREGNANCY

Centre	Abortion No.	Abortion %	Still Birth No.	Still Birth %	Live Birth No.	Live Birth %	N.A.	Total
Baroda	296	10.8	136	5.0	2310	84.2	1502	4244
Bombay(KEM)	358	12.0	86	2.9	2529	85.1	1220	4193
Bombay (NWM)	274	13.4	70	3.4	1694	83.1	1592	3630
Calcutta(Eden)	459	16.3	77	2.7	2285	81.0	2730	5551
Calcutta(RKM)	504	15.2	87	2.6	2735	82.2	3557	6883
Jamshedpur	304	16.2	61	3.2	1513	80.6	1664	3542
Madras	335	9.3	116	3.2	3139	87.4	2162	5752
New Delhi	654	33.9	159	8.2	1115	57.8	816	2744
Trivandrum	570	19.4	113	3.9	2251	76.7	1925	4859
Varanasi	149	10.4	64	4.5	1213	85.1	726	2152
Total	3903	15.2	969	3.8	20784	81.0	17894	43550

Percentages are row percentages

REASONS FOR HOSPITAL ADMISSIONS

Antenatal complications such as anaemia, hypertension in pregnancy, medical disorders associated with pregnancy increase the risk for mother and foetus. It is therefore necessary to admit these patients, particularly in our country, as the patients are unable to take bed rest as well as medication at home. Co-operating patients with good facilities at home could be given ambulatory treatment. However, in view of the high incidence of maternal and perinatal morbidity and mortality associated with medical and obstetric problems, it is considered preferable to hospitalise the patients. In this study, decision to admit the patient to the hospital was at the discretion of the attending physician.

There were 45680 hospital admissions for 43550 pregnant women registered in this study. Some women were admitted during antenatal period also, thus accounting for more than one hospital admission per woman. Medical problems were reasons for admission for 2683 patients (5.9% of admissions) and obstetric complications were present in 18461 cases (40.4% of admissions). Of the total admissions 37120 (81.3%) women delivered in the hospital. There were more than one reason for admission in some of the women (Table 2.01).

MEDICAL REASONS

Admissions for medical reasons varied from hospital to hospital. At Eden Hospital, Calcutta, medical problems were present in only 1.8 percent of hospital admissions compared to 10 to 13 percent at AIIMS, New Delhi, Trivandrum and Baroda Medical Colleges (Table 2.01).

Anaemia is perhaps the most common medical complication in pregnancy in developing countries. Severe anaemia can cause premature labour, IUGR, Infections, APH, PPH. Anaemia in pregnancy was reason for admission in 29.7 per 1000 admissions. Admissions for anaemia were as high as 111.9 per 1000 at Baroda. This accounted for 35.6 percent of total admissions for anaemia in all centres (Table 2.02). The haemoglobin level was 8 gm. percent or less in 4.9 per cent of total women admitted. In 59.8 percent of women who were admitted, the haemoglobin level was more than 10 gm. percent (Table 2.03).

Heart diseases were the reason for admission in 8.6 per 1000 admissions. The incidence of heart disease in pregnant women varied with the type of hospital. More than 45 percent of total admissions in this study for heart problems were from AIIMS, New Delhi and Trivandrum. This constituted 25 per 1000 admissions at Delhi and 21 per 1000 at Trivandrum.

Hepatitis in pregnancy is usually viral hepatitis. It occurs in malnourished mothers living in crowded unhygenic surroundings. There were 136 admissions due to hepatitis. Admissions for hepatitis were more in Trivandrum (6.2 per 1000 admissions) and Varanasi (5.0 per 1000 admissions) followed by Eden Hospital, Calcutta (4.5 per 1000 admissions) and Madras (3.4 per 1000 admissions).

Urinary tract infections in pregnancy is associated with higher rate of prematurity and foetal mortality. There were 125 (2.7 per 1000) admissions for urinary tract infections. Trivandrum reported maximum admissions for UTI (10.4 per 1000 admissions).

Diabetes may manifest itself for the first time in pregnancy or an already diabetic woman may become pregnant. Usually diabetes is a disease of later life, which might account for its low incidence in pregnancy. In this study, there were 127 (2.8 per 1000) admissions for diabetes. Maximum number of admissions for diabetes were from AIIMS, New Delhi (40 admissions, 12.8 per 1000 admissions), followed by Trivandrum (30 admissions, 5.7 per 1000 admissions).

There were 549 admissions (12.0 per 1000) due to other medical conditions such as respiratory problems, fevers of unknown origin, syphilis, acute abdomen, gastrointestinal problems etc. (Table 2.02).

OBSTETRIC COMPLICATIONS

Of the total hospital admissions 37120 (81.3%) were admitted for delivery. Some of these cases also had medical or obstetric complication. A total of 18461 cases, accounting for 40.4

percent of admissions were for obstetric complications, varying from 26.5 percent at KEM Hospital, Bombay to 56.4 percent of admissions at AIIMS, New Delhi (Table 2.01).

Maximum number of admissions during pregnancy were due to problems associated with abortions (90.5 per 1000 admissions). This includes admissions for spontaneous abortions, inevitable abortions, missed abortions, septic abortions, threatened abortions, ectopic pregnancies and vesicular moles. Admissions for abortion related problems varied from 22.7 per 1000 at KEM Hospital, Bombay to 166.6 per 1000 at Baroda (Table 2.04). This study only collected data of hospital admissions, therefore information on the follow up of cases of threatened abortion, vesicular mole etc. was not collected in this study.

Hypertensive disorders is one of the most important and common complication met with in pregnancy and contributes significantly to maternal and perinatal morbidity and mortality. Hypertension is a sign of an underlying pathology which may be pre existing or appears for the first time during pregnancy. The early identification of this clinical entity and effective management is important for both maternal and foetal outcome. Very often due to lack of antenatal care, hypertension is not detected till major complications occur. Rate of admissions for hypertensive disorders of pregnancy was 79.9 per 1000 hospital admissions in this study. Admissions for hypertensive disorders varied from 30.4 per 1000 at Bombay to almost 169.2 per 1000 at Jamshedpur. Other hospitals having large number of admissions (more than 100 per 1000) for hypertensive disorders were RKM, Calcutta; AIIMS, New Delhi; and SAT Hospital Trivandrum (Table 2.04). Blood pressure was recorded at every admission. The maximum number of recordings of high blood pressure were from Jamshedpur, followed by New Delhi and Trivandrum. For Jamshedpur in 44.1 per cent of admissions systolic blood pressure was between 130-220 mm.Hg. or more and in 21.4 per cent admissions diastolic B.P. was above 90 mm. Hg. At New Delhi in 31.2 per cent and Trivandrum in 21.0 per cent of admissions, systolic B.P. was 130 mm. Hg. or more and in 17.9 percent and 15.7 percent respectively diastolic B.P. was 90 mm.Hg. or more. Eden Hospital, Calcutta had the least number of admissions with high B.P. (6.3% with systolic B.P. more than 130 mm. Hg. and 3.6% with diastolic B.P. more than 90 mm. Hg.) (Table 2.05).

Pregnancy in Rh-ve women accounted for 9.5 per 1000 hospital admissions. There were 203 (4.4 per 1000) admissions for cervical incompetence. Although there may be a number of underlying causes which may result in premature labour or intra-uterine death, a diagnosis of premature labour was the reason for admission in 36.8 per 1000 and intrauterine death in 12.5 per 1000 of hospital admissions for obstetric reasons. Another 29.1 per 1000 hospital admissions were for malpresentation and 18.1 per 1000 were for antepartum haemorrhage. Other reasons for admissions included postdated pregnancy, bed obstetric history, multiple pregnancies and third stage complications, presence of ovarian tumor, uterine fibroid, or fistula.

The demographic and obstetric factors in relation to the outcome of pregnancies are discussed in detail in later parts of this report.

TABLE 2.01: NUMBER OF CASES AND HOSPITAL ADMISSIONS

Centre	Total cases	Total Admission	Number of admission for Medical Problems		Number of admission for Obstetric Problems		Delivery	
			No.	Rate/100	No.	Rate/100	No.	Rate/100
Baroda	4244	4317	565	13.1	1992	46.1	3117	72.2
Bombay (KEM)	4193	4364	138	3.2	1157	26.5	3795	87.0
Bombay (NWM)	3630	3916	308	7.9	1229	31.4	2882	73.6
Calcutta (Eden)	5551	5609	100	1.8	2557	45.6	4657	83.0
Calcutta (RKM)	6883	7414	152	2.1	2671	36.0	6196	83.6
Jamshedpur	3542	3634	192	5.3	1471	40.5	3132	86.2
Madras	5752	5815	164	2.8	2571	44.2	4953	85.2
New Delhi	2744	3126	332	10.6	1763	56.4	2248	71.9
Trivandrum	4859	5274	624	11.8	2197	41.6	4308	81.7
Varanasi	2152	2211	108	4.9	853	38.5	1832	82.9
Total	43550	45680	2683	5.9	18461	40.4	37120	81.3

TABLE 2.02: MEDICAL REASONS FOR ADMISSION (RATE PER 1000 ADMISSIONS)

Centre	Anaemia		Heart Disease		Hepatitis		UTI		Diabetes		Others		No Medical Complication		Total Admissions
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	
Baroda	483	111.9	24	5.6	7	1.6	8	1.8	2	0.5	45	8.1	3752	869.2	431
Bombay(KEM)	36	8.2	44	10.1	1	0.2	12	2.7	3	0.7	42	9.4	4226	968.2	436
Bombay(NWM)	250	6.4	20	5.1	8	2.0	3	0.8	1	0.3	26	6.7	3608	920.7	391
Calcutta(Eden)	19	3.4	9	1.6	25	4.5	2	0.4	18	3.2	27	4.6	5509	982.3	560
Calcutta(RKM)	27	3.6	15	2.0	15	2.0	21	2.8	4	0.5	70	9.0	7262	979.1	741
Jamshedpur	91	25.0	17	4.7	10	2.8	2	0.6	11	3.0	61	16.8	3442	947.1	363
Madras	47	8.1	35	6.0	20	3.4	4	0.7	16	2.8	42	7.2	5651	971.8	581
New Delhi	86	27.5	78	25.0	6	1.9	10	3.2	40	12.8	112	35.8	2794	393.8	312
Trivandrum	281	53.3	111	21.0	33	6.2	55	10.4	30	5.7	114	21.6	4650	881.7	527
Varanasi	35	15.8	38	17.2	11	5.0	8	3.6	2	0.9	14	6.3	2103	951.2	221
Total	1355	29.7	391	8.6	136	3.0	125	2.7	127	2.8	549	12.0	42997	941.2	4568

TABLE 2.03: HAEMOGLOBIN LEVEL (gm%) AT ADMISSION

Centre	≤ 8 No.	≤ 8 Rate %	9-10 No.	9-10 Rate %	10 No.	10 Rate%	Not done No.	Not done Rate %	Total Admissions	Average±S.D.
Baroda	582	13.5	2367	54.8	1228	28.4	140	3.2	4317	9.6±1.8
Bombay(KEM)	164	3.8	2011	46.1	2030	46.5	159	3.6	4364	10.2±1.2
Bombay(NWM)	205	5.2	1194	30.5	2441	62.3	76	1.9	3916	10.5±1.3
Calcutta(Eden)	62	1.1	1613	28.8	3792	67.6	142	2.5	5609	10.4±0.8
Calcutta(RKM)	212	2.9	1744	23.5	5130	69.2	328	4.4	7414	11.0±1.2
Jamshedpur	96	2.6	186	5.1	2953	81.3	399	11.0	3634	11.1±1.2
Madras	237	4.1	1524	26.2	3766	64.8	288	5.0	5815	10.8±1.6
New Delhi	141	4.5	753	24.1	2151	68.8	81	2.6	3126	10.4±1.6
Trivandrum	474	9.0	1853	35.1	2826	53.6	121	2.3	5274	10.2±1.5
Varanasi	76	3.4	313	14.2	979	44.3	843	38.1	2211	10.9±1.7
Total	2249	4.9	13558	29.7	27296	59.8	2577	5.6	45680	10.7±1.5

TABLE 2.04: OBSTETRIC REASONS FOR ADMISSION (RATE PER 1000 ADMISSIONS)

Centre	Abor-tions	Hyper-tensive Disor-ders	Rh-ve	Cervi-cal In-compe-tence	Intra-uterine Death	Mal-presen-tation	IUGR	Ante-Partum Haemo-rrhage	Pre-mature Labour	Foetal Dist-ress	Pro-longed Obst-ructed labour	Others	No Obs-tetric Compli-cation	Total
Baroda	166.6	69.3	4.4	1.6	14.4	25.2	1.6	18.3	120.0	2.3	9.0	29.2	538.7	4317
Bombay(KEM)	22.7	35.1	7.8	6.6	8.7	19.7	7.8	11.7	39.9	8.5	0.7	96.0	734.9	4364
Bombay(NWM)	66.7	30.4	9.2	16.6	3.1	8.9	17.9	2.6	14.6	-	0.8	14.3	686.2	3916
Calcutta (Eden)	141.0	37.8	4.3	1.6	21.4	49.6	13.2	21.8	18.2	3.9	10.3	132.8	544.1	5609
Calcutta(RKM)	72.0	103.3	3.8	3.0	7.6	16.7	18.6	14.0	37.9	0.4	0.8	82.1	639.7	7414
Jamshedpur	47.6	169.2	10.2	0.8	9.6	21.2	3.3	16.0	7.2	1.7	0.8	117.2	595.2	3634
Madras	117.1	73.1	10.8	0.3	17.4	26.3	0.5	20.8	23.0	-	0.2	152.5	557.9	5815
New Delhi	101.1	125.4	23.7	21.1	12.5	38.1	23.9	29.4	55.0	8.0	5.4	120.3	436.0	3126
Trivandrum	71.5	101.1	19.5	-	8.9	53.3	11.0	26.5	13.8	5.3	3.2	102.4	583.4	5274
Varanasi	82.8	43.0	6.3	0.9	28.5	28.5	4.1	22.6	65.6	8.6	14.5	80.5	614.2	2211
Total	90.5	79.0	9.5	4.4	12.5	29.1	10.5	18.1	36.8	3.3	3.9	106.5	594.3	45680

TABLE 2.05: BLOOD PRESSURE AT ADMISSION(mm Hg.)

Centre	Systolic						Diastolic				Not Recorded	Total
	<130		130-220		>220		<90		90-100			
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%		
Baroda	3778	87.6	531	12.3	2	0.05	3931	91.2	380	8.8	6	4317
Bombay(KEM)	3803	87.2	560	12.8	-	-	3971	91.0	392	9.0	1	4364
Bombay(NWM)	3606	92.3	301	7.7	-	-	3688	94.4	219	5.6	9	3916
Calcutta(Eden)	5249	93.6	354	6.3	1	0.02	5400	96.4	204	3.6	5	5609
Calcutta(RKM)	6201	83.7	1204	16.2	2	0.03	6576	88.8	831	11.2	7	7414
Jamshedpur	2027	55.8	1599	44.1	2	0.06	2853	78.6	775	21.4	6	3634
Madras	5122	88.1	689	11.8	1	0.02	5379	92.5	433	7.5	3	5815
New Delhi	2149	68.8	973	31.2	-	-	2563	82.1	559	17.9	4	3126
Trivandrum	4159	79.0	1106	21.0	-	-	4438	84.3	827	15.7	9	5274
Varanasi	1958	88.7	249	11.3	-	-	2040	92.4	167	7.6	4	2211
Total	38052	83.3	7566	16.6	8	0.01	40839	89.5	4787	10.45	54	45680

ABORTIONS

Abortion is a common complication of pregnancy. There were 4134 cases of abortions in this study of which 3111 (75.3%) were inevitable abortions. Of the remaining, 507 (12.3%) were threatened abortions, 143 (3.5%) missed abortions, 193 (4.7%) septic abortions, 90 (2.2%) vesicular mole and 90 (2.2%) were ectopic pregnancy (Table 3.01). Of the 507 threatened abortions, information on outcome was available in 228 (44.9%) of which 23 (10.1%) pregnancies ended in spontaneous abortion. There were 7 (3.1%) still births, and 198 (86.8%) live births. Two babies died during hospital stay.

A number of women abort at home spontaneously without any problem. It is therefore difficult to get accurate incidence of abortions, but it is estimated that about 10 percent of all pregnancies end in abortions. In this study too of the total cases registered 9.5 percent were abortions.

OBSERVATIONS

Abortions were studied in relation to important demographic and obstetric factors.

Age

The mean age of abortion cases was 25.1±4.9 years as compared to 24.3±4.3 years for total cases. The incidence of abortion was significantly higher in women ≤ 16 years of age and in women ≥ 35 years of age ($p < .05$). Abortions in these age groups constituted 15.8 and 40.1 percent of total cases in those age groups (Table 3.02).

Education

Among the women who aborted, 1244 (30.1%) were illiterate. This constituted 11.5 percent of total cases with no education. The literacy rate was lower (69.9%) in abortion cases as compared to total cases (75.1%) (Table 3.03) ($p < .05$).

Occupation

Employed women constituted 9.8 percent of abortion cases, of which 4.1 percent women were labourers. The incidence of abortion was highest among the labourers (16.4%) as compared to 10.2 percent in service class and 11.5 percent among self employed women. The number of self employed women were comparatively small (0.3%). Among the housewives incidence of abortion was 9.3 percent (Table 3.04) which was significantly less than among labourers ($p < .05$).

Previous Pregnancies

Of the total abortions 37.5 percent were in primigravida. The abortion rate increased with increase in parity after excluding primis. It increased from 8.8 percent in women with 1 or 2 pregnancies to 21.1 percent in women with more than 5 pregnancies ($p < .001$). The average number of pregnancies per woman was 1.4 in abortion cases and 1.2 in total cases(Table 3.05).

History of Abortion

Women with previous spontaneous abortions accounted for 15.9 percent of abortions in this pregnancy. The risk of abortion is more in women who have had previous spontaneous abortions. The abortion rate was 13.6 percent in women with history of one spontaneous abortion and 16.4 percent in women with history of two or more abortions as compared to 8.9 percent in women with no previous spontaneous abortion ($p < .001$). Abortion rate was also significantly higher for women with history of induced abortions ($p < .05$). The average number of spontaneous abortions per woman was 0.23 and of induced abortion was 0.03 in abortion cases as compared to 0.16 spontaneous abortions and 0.02 induced abortions in total cases (Table 3.06 & 3.07).

Previous still births

There was no relationship between abortions and history of previous still birth. There were 0.04 still births/woman in both abortion and total cases (Table 3.08).

Interval since last pregnancy termination

Risk of abortion decreased with increase in inter pregnancy interval. Rate of abortion was significantly higher when inter pregnancy interval was less than one year (19.7% for $\leq$6 months and 17.4% for 7-12 months) compared to 9.9 and 8.1 percent when the women had conceived within one to two years or after 2 years of last pregnancy termination (Table 3.09).

Management

In majority of the women who were admitted with abortions, dilatation and curettage, or suction curettage was the only surgical management that was required. This procedure was carried out on 2524 (61.1%) women. There were 116 laparotomies performed for management of 89 cases of ectopic pregnancies, 23 cases of septic abortion and remaining were for repair of visceral injuries. In addition there were 9 hysterectomies performed, in 8 cases of septic abortion and one for a case of ectopic pregnancy. 9 women already had D&C done elsewhere at the time of admission to hospital.

SEPTIC ABORTIONS

Out of a total of 4134 women, admitted with problems related to abortions, 193 (4.7%) were diagnosed as cases of septic abortion. Trivandrum, Varanasi and Madras reported eight to nine percent of abortion cases as cases of septic abortions. These constituted approximately one percent (0.62 to 1.1%) of the total admissions at these centres. At Bombay, NWM centre percentage of septic cases was as low as 0.4 percent of total abortion cases (Table 3.10).

Age

Average age of cases of septic abortion was 25.9 years as compared to an overall average age of 24.3 years for all women and 25.1 years for all abortion cases. The difference in age of abortion cases and total cases, was not statistically significant. But in young teenagers ($\leq$16 years) and in elderly women ($\geq$35 years) 13.0 percent and 11.6 percent of the abortions were cases of septic abortions. This constituted 2.1 and 4.6 percent of total cases respectively. This indicates significantly higher incidence of septic abortions in very young and elderly women ($p < .05$) (Table 3.11).

Education

Literacy rate among cases of septic abortion was observed to be only 55 percent as compared to 75 percent among all cases and 70 percent among all cases of abortion. This difference was found to be statistically significant ($p < .01$). A clear trend of decrease in incidence of septic abortions with increase in education has been observed. The rate of septic abortions as of total abortions decreased from 7.0 percent among illiterate women to 0.5 percent among women who had education of college level or higher ($p < .001$). Similarly considering the total cases of pregnancy the rate of abortions had decreased from 0.8 percent to 0.04 percent ($p < .001$) (Table 3.12).

Occupation

Incidence of septic abortion was significantly higher among working women. These women were working as labourers or were self employed in petty business or handicrafts etc. Septic abortion rate in labourers was 2.7 percent of total cases and 16.5 percent of abortion cases as compared to women who had regular paid job like teachers, clerks or other office jobs (0.23% of total cases and 2.3% of abortion) or were housewives (0.39% of total cases and 4.2% of abortion cases) ($p < .01$). Percentage of working women was significantly higher among cases of septic abortion ($p < .01$). Of the women who had septic abortion 18.1 percent were working as compared to 9.7 percent among total abortion cases and 7.6 percent among total cases(Table 3.13).

Parity

Higher parity has also been observed to be a contributing factor to septic abortions. Mean parity among women who had septic abortion was 1.9 in comparison to 1.2 among total cases and 1.4 among all cases of abortions taken together. Incidence of septic abortion among grand multiparous women (parity > 5) was 2.2 percent, which was significantly higher than 0.3 percent among women with parity less than three ($p < .01$). Among women with parity three to five this rate was one percent (Table 3.05). It was observed that incidence of septic abortion increased from 3.5 percent to 10.6 percent of total abortions with increasing number of pregnancies if the primigravidae were excluded ($p < .001$) (Table 3.14).

History of spontaneous abortions

Although spontaneous abortions in past had positive association with abortion in general it showed no bearing to septic abortion. Average number of spontaneous abortions per woman was found to be 0.12 in cases of septic abortion and 0.16 and 0.23 in total cases of admission and cases of abortion respectively. Incidence of septic abortion among women who had 2 or more previous abortions was 0.42 percent as compared to 0.46 percent among women who had no history of abortion (Table 3.15).

History of interference

Of the total 4134 cases of abortion 393 (9.5%) gave a history of interference prior to coming to hospital, whereas of the 193 cases of septic abortion 151 women (78.2%) had come with prior interference. Methods used for induction of abortion included use of bougies, tents, injections, drugs, dilatation and curettage or suction curettage and intra as well as extra amniotic instillations of saline.

In cases of septic abortion,following induction methods were used: 34 women (22.5%) had D&C, one woman had extraamniotic instillation of saline and in the remaining women some drug, vaginal paste, sticks or tents had been used. Sixty seven (44.4%) women said that the procedure was performed by a doctor, 6(4.0%) had been to ANM, 58(38.4%) to local dai and in the remaining 20 women (13.2%) the induction of abortion was attempted by a neighbour or a relative.

Subsequent Surgery

Of the total 193 cases of septic abortion, 44(22.8%) women required no further surgery after admission to hospital and were managed with conservative therapy. 101(52.4%) women required only dilatation and curettage and 2 women (1.0%) had manual removal of placenta. Laparotomy was done in 23 (11.9%) cases, 8 women required hysterectomy 2 for uncontrolled bleeding and six for uterine injury, 12 (6.2%) women had colpotomy, 2(1.0%) had resection anastamosis of bowels and one woman had colostomy (0.5%).

MATERNAL DEATHS

There were 24 maternal deaths due to abortions giving a mortality rate of 6.4 per 1000 abortions. This excludes data from one of the participating centres which did not provide satisfactory information on maternal mortality. Of these, majority of the deaths (16) were due to septic abortions, two deaths were due to ectopic pregnancy, two women died due to haemorrhage in incomplete abortion, and one woman each due to jaundice, pulmonary embolism, anaemia and CCF in a case of hypertension. Septic abortions accounted for 66.6 percent of the deaths in abortion cases. Maternal mortality among septic abortions was 9.8 percent.

DISCUSSION

The magnitude of foetal wastage in humans is significant. About 10 percent of recognised clinical pregnancies end in abortion and many more fertilised ova do not get implanted. The causes of abortion range from cytogenetic factors, anatomical abnormalities of the uterus (such as incompetent cervical os-fibroids of uterus or intrauterine synechia) to infections and even hormonal and immunological factors. This study does not cover the aetiopathology but the relationship of factors such as age, parity, occupation, literacy, previous obstetric history etc. to abortions. The demographic and obstetric characteristics of women admitted for septic abortions are certainly significant.

Abortions constituted 9.5 percent of the total women registered for this study. Majority of the abortions (75.3%) were inevitable abortions. Other reasons for admission in abortion cases were threatened abortion (12.3%), missed abortions (3.5%) septic abortions (4.7%), vesicular mole (2.2%) and ectopic pregnancies (2.2%).

There was no difference in the mean age at which abortion occured as compared to the total cases registered for the study. An increased incidence was seen in women /16 years and in women 35 years or above. The abortion rate also increased with increase in parity excluding primigravidas. It ranged from 8.8 percent in women with 1-2 pregnancies to 21.1 percent in women with more than 5 pregnancies. Similar increase of abortion

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rate with increase in parity has been reported in other studies conducted at Bangladesh and USA[1,2,3]. Others have reported increased risk of spontaneous abortion with increasing parity order but not with age[4]. According to W.H.James women with high reproductive losses compensated by having more pregnancies. Moreover pathological studies of spontaneously aborted foetus shows that more than 10 percent of spontaneous abortions are causally related to maternal age or birth order[5,6,7]. An increased risk of overripe gametes being fertilised with decrease in coital frequency may be another factor responsible for increased abortions in older women.

The literacy rate was slightly lower in the women who aborted (69.9%) as compared to total cases (75.1%). Similarly abortion rates were higher among the labourers (16.4%) as compared to the service class (10.2%) and housewives (9.3%). This study also showed an increased abortion rate in women less than or 16 years of age. This is probably because it is the poor and illiterate women who are married early and conceive early. Hutchins et al have observed that teenage pregnancy primarily reflects the characteristics of the population to which she belongs and only secondarily on any inherent risk based on maternal age[8]. With regard to previous obstetric history the risk of abortion was found to be more in women who had previous spontaneous abortions (13.6% and 16.4%) as compared to women with no history of abortion (8.9%). The causes of recurrent abortion are mostly obscure but important known causes are physical, hormonal or infectious disorder in the mother, and defects in the ovum or feto-maternal obstructions. Previous history of still birth did not show any relationship with abortion in this pregnancy.

The data was analysed for demographic and obstetric characteristics of women who were admitted for septic abortions. Septic abortions constituted 4.7% of all abortion admissions. Padubidri reported a septic abortion rate of 6.6% in Lok Nayak Jaiprakash Narayan Hospital at Delhi[9]. Although the average age of cases of septic abortion was not significantly higher than the average age for all abortion cases, the rate of septic abortions was significantly higher in the teenagers and elderly women. An ICMR collaborative study (unpublished) showed that almost 50% of septic abortion cases were illiterate. As with

total abortions, the septic abortion rate was higher among the illiterate and among the labourers and increased with increase in age and parity. The reasons here are probably more sociological as desire for secrecy and ignorance of law related to MTP may be the major contributing factors.

There were 24 cases of deaths in abortion cases in this study. Of these majority of deaths (16) were due to septic abortions, 2 deaths due to ectopic pregnancy, 2 due to haemorrhage due to incomplete abortion and one each due to jaundice, pulmonary embolism, anaemia and CCF in a case of hypertension. Deaths due to septic abortions accounted for 12.9 percent of all deaths due to pregnancy. The mortality rate due to abortions was 0.64 percent. Although abortions may not be preventable, the maternal mortality due to abortions can certainly be prevented

Formal and non formal education to young girls, increased awareness of contraception as well as knowledge regarding legal and hygienic places for MTP will certainly reduce the risk of septic abortion and morbidity and mortality that follows. Moreover early hospitalisation, aggressive treatment and management of aerobic and anaerobic infections and timely surgical interference when necessary would certainly improve the results.

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TABLE 3.01: TYPE OF ABORTION

Centre	Inevitable No.	%	Threatened No.	%	Missed No.	%	Septic No.	%	Vesicular Mole No.	%	Ectopic No.	%	Total Abortions	Total Cases
Baroda	617 (14.54)	85.8	38 (0.90)	5.3	12 (0.28)	1.7	25 (0.59)	3.5	16 (0.38)	2.2	11 (0.26)	1.5	719 (16.94)	4244
Bombay (KEM)	72 (1.72)	72.7	11 (0.26)	11.1	4 (0.10)	4.0	1 (0.02)	1.0	6 (0.14)	6.1	5 (0.12)	5.1	99 (2.36)	4193
Bombay (NWM)	217 (5.98)	83.1	6 (0.17)	2.3	27 (0.74)	10.3	1 (0.03)	0.4	5 (0.14)	1.9	5 (0.14)	1.9	261 (7.19)	3630
Calcutta (Eden)	622 (11.21)	78.6	103 (1.86)	13.0	8 (0.14)	1.0	32 (0.58)	4.0	8 (0.14)	1.0	18 (0.32)	2.3	791 (14.25)	5551
Calcutta (RKM)	417 (6.06)	78.1	100 (1.45)	18.7	6 (0.09)	1.1	5 (0.07)	0.9	3 (0.04)	0.6	3 (0.04)	0.6	534 (7.76)	6883
Jamshedpur	93 (2.63)	53.8	62 (1.75)	35.8	6 (0.17)	3.5	9 (0.25)	5.2	2 (0.06)	1.2	1 (0.03)	0.6	173 (4.88)	3542
Madras	567 (9.86)	83.3	25 (0.43)	3.7	6 (0.10)	0.9	63 (1.10)	9.3	10 (0.17)	1.5	10 (0.17)	1.5	681 (11.84)	5752
New Delhi	188 (6.85)	59.5	49 (1.79)	15.5	41 (1.49)	13.0	11 (0.40)	3.5	9 (0.33)	2.8	18 (0.66)	5.7	316 (11.52)	2744
Trivandrum	183 (3.77)	48.5	102 (2.10)	27.1	28 (0.58)	7.4	30 (0.62)	8.0	25 (0.51)	6.6	9 (0.19)	2.4	377 (7.76)	4859
Varanasi	135 (6.27)	73.8	11 (0.51)	6.0	5 (0.23)	2.7	16 (0.74)	8.7	6 (0.28)	3.3	10 (0.46)	5.5	183 (8.5)	2152
Total	3111	75.3	507	12.3	143	3.5	193	4.7	90	2.2	90	2.2	4134	43550
Percentage (% of Total)	(7.14)		(1.16)		(0.33)		(0.44)		(0.21)		(0.21)		(9.5)	

- Figures in parenthesis are percentage of abortions as of total cases registered
- Percentages are row percentages

TABLE 3.02: ABORTIONS - AGE

Centre	≤16 No.	≤16 %	17-19 No.	17-19 %	20-34 No.	20-34 %	≥35 No.	≥35 %	N.K. No.	Total Abortions	Mean Age ± S.D. Abortions	Mean Age ± S.D. Total Cases
Baroda	4	0.6	55	7.7	624	86.9	36	4,9	-	719	24,3±4.7	24.4±4.4
Bombay(KEM)	1	1.0	6	6.1	90	90.9	2	2.0	-	99	24.2±4.0	24.3±4.4
Bombay(NWM)	1	0.4	35	13.4	212	81.2	13	5.0	-	261	24.4±4.9	23.6±3.9
Calcutta (Eden)	13	1.7	105	13.3	642	81.5	27	3.4	4	791	23.6±4.5	23.5±3.9
Calcutta(RKM)	9	1.7	37	6.9	453	85.0	34	6.4	1	534	25.5±5.0	24.7±4.3
Jamshedpur	1	0.6	15	8.8	135	78.4	21	12.3	1	173	26.0±6.1	24.0±4.3
Madras	12	1.8	120	17.6	503	73.8	46	6.8	-	681	24.4±5.4	23.8±4.5
New Delhi	-	-	10	3.2	282	89.7	23	7.1	1	316	24.8±4.8	26.1±4.2
Trivandrum	2	0.5	37	9.8	322	85.4	16	4.2	-	377	26.0±4.5	24.6±4.3
Varanasi	3	1.6	13	7.1	143	78.1	24	13.1	-	183	25.5±5.8	25.1±4.9
Total(Abortion)	46	1.1	433	10.5	3406	82.6	242	5.8	7	4134	25.1±4.9	24.3±4.3
Total cases	291		4183		38445		603		28	43550		
Abortion (% of total)	15.8		10.4		8.9		40.1			9.5		

Percentages are row percentages

TABLE 3.03: ABORTIONS - EDUCATION

Centre	Nil No.	Nil %	Primary No.	Primary %	Higher Secondary No.	Higher Secondary %	College or above No.	College or above %	Total	Literacy rate Abortion cases	Literacy rate Total cases
Baroda	372	51.5	253	35.2	89	12.4	7	0.9	719	48.5	50.1
Bombay(KEM)	26	26.3	39	39.4	33	33.3	1	1.0	99	73.7	66.8
Bombay(NWM)	57	21.8	61	23.4	137	52.5	7	2.7	261	78.2	80.0
Calcutta(Eden)	209	26.4	165	20.9	334	42.3	83	10.5	791	73.6	74.5
Calcutta(RKM)	94	17.7	101	18.9	233	43.6	106	19.9	534	82.3	85.5
Jamshedpur	72	41.3	57	33.1	28	16.3	16	9.3	173	58.7	75.3
Madras	265	38.8	211	31.0	199	29.3	6	0.9	681	61.2	69.5
New Delhi	61	19.1	38	12.1	111	34.8	106	33.9	316	80.9	82.7
Trivandrum	31	8.3	116	30.8	209	55.5	22	5.8	377	91.7	92.8
Varanasi	61	33.3	42	23.0	50	27.3	30	16.4	181	66.7	66.4
Total(Abortion)	1244	30.1	1083	26.2	1423	34.4	384	9.2	4134	69.9	
Total cases	10831		12493		15471		4755		43550		75.1
Abortion(% of total)	11.5		8.7		9.2		8.1		9.5		

Percentages are row percentages

TABLE 3.04: ABORTIONS - OCCUPATION

Centre	Labourer No.	Labourer %	Service No.	Service %	Self Employed No.	Self Employed %	Housewife No.	Housewife %	Total	% of working women Abortions	% of working women Total Cases
Baroda	90	12.5	19	2.7	1	0.1	609	84.7	719	16.3	11.7
Bombay(KEM)	-	-	8	8.1	-	-	91	91.9	99	8.1	4.8
Bombay(NWM)	6	2.3	11	4.2	1	0.4	243	93.1	261	6.9	4.7
Calcutta(Eden)	14	1.8	63	8.0	5	0.6	709	89.6	791	10.4	12.1
Calcutta(RKM)	4	0.8	35	6.6	1	0.2	494	92.5	534	7.5	5.9
Jamshedpur	2	1.2	5	2.9	-	-	166	96.0	173	4.0	3.2
Madras	16	2.3	16	2.3	-	-	649	95.3	681	4.7	2.2
New Delhi	7	2.2	43	13.7	3	1.0	263	83.0	316	17.0	20.2
Trivandrum	30	7.9	19	5.1	-	-	328	87.0	377	13.0	10.4
Varanasi	1	0.5	2	1.0	1	0.5	179	97.8	181	2.2	2.8
Total(Abortions)	170	4.1	221	5.4	12	0.3	3731	90.2	4134	9.8	
Total cases	1039		2165		104		40242		43550		7.6
Abortions(% of Total)	16.4		10.2		11.5		9.3		9.5		

Percentages are row percentages

TABLE 3.05: ABORTIONS-NUMBER OF PREVIOUS PREGNANCIES

Centre	0		1-2		3-5		> 5		Total Cases	Average/woman Abortion	Total cases
	No.	%	No.	%	No.	%	No.	%			
Baroda	264	36.6	290	40.4	149	20.8	16	2.2	719	1.5	1.4
Bombay(KEM)	25	25.3	56	56.6	17	17.2	1	1.0	99	1.5	1.4
Bombay(NWM)	101	38.7	119	45.6	38	14.6	3	1.1	261	1.3	1.0
Calcutta(Eden)	381	48.2	304	38.4	92	11.6	14	1.8	791	1.1	1.0
Calcutta(RKM)	260	48.7	204	38.2	62	11.6	8	1.5	534	1.0	0.9
Jamshedpur	52	29.7	58	33.7	53	30.8	10	5.8	173	2.0	1.1
Madras	202	29.7	299	44.0	163	23.8	17	2.5	681	1.6	1.2
New Delhi	78	24.6	136	43.1	85	26.8	17	5.4	316	2.0	1.6
Trivandrum	127	33.7	178	47.2	66	17.5	6	1.6	377	1.4	1.1
Varanasi	63	34.4	61	33.3	47	25.7	12	6.6	183	1.9	1.6
Total Abortion	1553	37.5	1705	41.3	772	18.7	104	2.5	4134	1.4	
Total Cases	17902		19422		5734		492		43550		1.2
Abortions (% of Total)	8.7		8.8		13.5		21.1		9.5		

Percentages are row percentages

TABLE 3.06: ABORTIONS-HISTORY OF PREVIOUS SPONTANEOUS ABORTIONS

Centre	0 No.	%	1 No.	%	⩾2 No.	%	Total	Average/woman Abortion Cases	Total cases
Baroda	623	86.6	72	10.0	24	3.3	719	0.18	0.11
Bombay(KEM)	75	75.8	17	17.2	7	7.0	99	0.36	0.16
Bombay(NWM)	213	81.5	35	13.5	13	5.0	261	0.25	0.13
Calcutta(Eden)	728	92.0	33	4.2	30	3.9	791	0.17	0.20
Calcutta(RKM)	477	89.3	40	7.5	17	3.2	534	0.15	0.09
Jamshedpur	131	75.6	31	18.0	11	6.4	173	0.31	0.14
Madras	596	87.6	62	9.1	23	3.2	681	0.18	0.09
New Delhi	198	62.0	56	17.9	62	20.1	316	0.77	0.50
Trivandrum	275	72.9	64	17.0	38	10.2	377	0.42	0.20
Varanasi	159	86.7	13	7.2	11	6.2	183	0.23	0.15
Total Abortion	3475	84.1	423	10.2	236	5.7	4134	0.23	
Total Cases	39004		3109		1437		43550		0.16
Abortion(% of Total)	8.9		13.6		16.4		9.5		

Percentages are row percentages

TABLE 3.07: ABORTIONS-NUMBER OF PREVIOUS INDUCED ABORTIONS

Centre	0 No.	%	1 No.	%	⩾2 No.	%	Total	Average/woman Abortion cases	Total cases
Baroda	714	99.3	5	0.7	-	-	719	0.01	0.01
Bombay(KEM)	97	98.0	1	1.0	1	1.0	99	0.03	0.01
Bombay(NWM)	255	97.7	6	2.3	-	-	261	0.02	0.01
Calcutta(Eden)	762	96.2	27	3.5	2	0.2	791	0.04	0.04
Calcutta(RKM)	518	97.0	14	2.6	2	0.4	534	0.03	0.02
Jamshedpur	168	97.1	3	1.7	2	1.2	173	0.05	0.02
Madras	672	98.7	6	0.9	3	0.4	681	0.02	0.01
New Delhi	297	93.8	17	5.5	2	0.7	316	0.07	0.09
Trivandrum	359	95.2	18	4.8	-	-	377	0.05	0.02
Varanasi	181	98.9	2	1.1	-	-	183	0.01	0.03
Total abortions	4023	97.3	99	2.4	12	0.2	4134	0.03	
Total cases	42693		751		106		43550		0.02
Abortions(% of Total)	9.4		13.2		11.3		9.5		

Percentages are row percentages

TABLE 3.08: ABORTIONS - HISTORY OF STILL BIRTHS

Centre	Nil No.	%	One No.	%	Two or more No.	%	Total No.	Average/woman Abortion cases	Total cases
Baroda	680	94.6	30	4.2	9	1.2	719	0.07	0.05
Bombay(KEM)	95	96.0	3	3.0	1	1.0	99	0.05	0.04
Bombay(NWM)	256	98.1	5	1.9	-	-	261	0.02	0.03
Calcutta(Eden)	788	99.6	3	0.4	-	-	791	0.00	0.01
Calcutta(RKM)	528	98.9	5	0.9	1	0.2	534	0.01	0.02
Jamshedpur	167	96.5	5	2.9	1	0.6	173	0.04	0.03
Madras	652	95.7	24	3.5	5	0.7	681	0.05	0.03
New Delhi	295	93.4	19	6.0	2	0.6	316	0.07	0.10
Trivandrum	364	96.6	10	2.6	3	0.8	377	0.04	0.05
Varanasi	179	97.8	3	1.6	1	0.5	183	0.03	0.05
Total Abortions	4004	96.9	107	2.6	23	0.5	4134	0.04	
Total cases	41944		1321		285		43550		0.04
Abortions(% of Total)	9.5		8.1		8.1		9.5		

Percentages are row percentages

TABLE 3.09: ABORTIONS-INTERVAL SINCE LAST PREGNANCY TERMINATION(MONTHS)

Centre	≤6 No.	≤6 Rate/100	7-12 No.	7-12 Rate/100	13-24 No.	13-24 Rate/100	>24 No.	>24 Rate/100	N.A.	Total
Baroda	29	6.4	71	15.6	202	44.4	153	33.6	264	719
Bombay(KEM)	3	4.1	10	13.5	33	44.6	28	37.8	25	99
Bombay(NWM)	8	5.0	34	21.3	51	31.9	67	41.8	101	261
Calcutta(Eden)	17	4.1	110	26.8	156	38.0	127	31.0	381	791
Calcutta(RKM)	14	5.1	25	9.1	74	27.0	161	58.8	260	534
Jamshedpur	13	10.7	23	19.0	41	33.9	44	36.4	52	173
Madras	25	5.2	59	12.3	170	35.5	225	47.0	202	681
New Delhi	27	11.3	45	18.9	71	29.8	95	39.9	78	316
Trivandrum	42	16.8	50	20.0	59	23.6	99	39.6	127	377
Varanasi	5	4.2	8	6.7	29	24.2	78	65.0	63	183
Total Abortions	183	7.1	435	16.9	886	34.3	1077	41.7	1553	4134
Total cases	929		2507		8946		13274		17894	43550
Abortions(% of Total)	19.7		17.4		9.9		8.1		8.9	9.5

TABLE 3.10: SEPTIC ABORTIONS

Centre	Total cases	Total Abortions	Septic Abortions	Septic abortions as % of Total Abortions	% of Total cases
Baroda	4244	719	25	3.5	0.59
Bombay(KEM)	4193	99	1	1.0	0.00
Bombay(NWM)	3630	261	1	0.4	0.00
Calcutta(Eden)	5551	791	32	4.0	0.58
Calcutta(RKM)	6883	534	5	0.9	0.07
Jamshedpur	3545	173	9	5.2	0.25
Madras	5752	681	63	9.3	1.10
New Delhi	2744	316	11	3.5	0.40
Trivandrum	4859	377	30	8.0	0.62
Varanasi	2152	183	16	8.7	0.74
Total	43550	4134	193	4.7	0.44

TABLE 3.11: SEPTIC ABORTIONS - AGE

Age(Years)	Total Cases	Total Abortions	Septic Abortions	Septic Abortions as % of Total Abortions	Total cases
⩽16	291	46	6	13.0	2.06
17-19	4183	433	32	7.4	0.76
20-34	38445	3406	126	3.7	0.33
⩾35	603	242	28	11.6	4.64
N.K.	28	7	1		
Total	43550	4134	193	4.7	0.44
Average Age±S.D	24.3±4.3	25.1±4.9	25.9±6.6		

TABLE 3.12: SEPTIC ABORTIONS - EDUCATION

Education	Total Cases	Total Abortions	Septic Abortions	Septic Abortions as % of Total Abortions	Septic Abortions as % of Total Cases
Nil	10831	1244	87	7.0	0.80
Primary	12493	1083	48	4.4	0.38
Higher Secondary	15471	1423	56	3.9	0.36
College or above	4755	384	2	0.5	0.04
Total	43550	4134	193	4.7	0.44
Literacy rate (%)	75.1	69.9	54.9		

TABLE 3.13: SEPTIC ABORTIONS - OCCUPATION

Occupation	Total Cases	Total Abortions	Septic Abortions	Septic Abortions as % of Total Abortions	Septic Abortions as % of Total cases
Labourer	1039	170	28	16.5	2.69
Service	2165	221	5	2.3	0.23
Self employed	104	12	2	16.7	1.92
House Wife	40242	3731	158	4.2	0.39
Total	43550	4134	193	4.7	0.44
% Working	7.6	9.7	18.1		

TABLE 3.14: SEPTIC ABORTIONS-NO. OF PREVIOUS PREGNANCIES

No. of Pregnancies	Total Cases	Total Abortions	Septic Abortions	Septic Abortions as % of Total Abortions	Septic Abortions as % of Total Cases
0	17902	1553	65	4.2	0.36
1-2	19422	1705	59	3.5	0.30
3-5	5734	772	58	7.5	1.01
>5	492	104	11	10.6	2.23
Total	43550	4134	193	4.7	0.44
Average per woman	1.2	1.4	1.9		

TABLE 3.15: SEPTIC ABORTIONS-PREVIOUS SPONTANEOUS ABORTIONS

No. of Previous Spont. abortions	Total Cases	Total Abortions	Septic Abortions	Septic Abortions as % of Total Abortions	Septic Abortions as % of Total cases
0	39004	3475	179	5.2	0.46
1	3109	423	8	1.9	0.26
⩾ 2	1437	236	6	2.5	0.42
Total	43550	4134	193	4.7	0.44
Average per woman	0.16	0.23	0.12		

OUTCOME OF HOSPITAL DELIVERIES

Details of delivery were available in 37120 (85.2%) women. This sample was analysed for obstetric procedures and outcome of delivery and their associations with demographic and obstetric factors. The demographic and obstetric profiles of cases of delivery and of registered cases were compared.

The outcome of delivery was live birth in 35740 (96.3%) and still birth in 1380(3.7%) women. The total perinatal loss was 5.8% as 767 (2.1%) babies died before discharge from the hospital.

DEMOGRAPHIC PROFILE

Demographic profile of women who had delivered in the hospital was comparable to that of total registered sample.

Residence

Majority of the women (76.9%) who delivered in the hospital were from the respective cities. Distribution of women coming from city, city slums, towns and villages was similar for total women registered for the study and women who delivered in the hospital. Outcome of delivery was still birth in 7.8 percent of women coming from rural areas, which was significantly high ($p < .001$). Still birth rate in women living in city slums (4.1%) was significantly higher as compared to other city (2.9%) and town (3.3%) women ($p < 0.05$). Although still birth rate of 3.3 percent among town women was slightly higher than 2.9 percent for city women, the difference was not statistically significant (Table 4.01).

Religion

Still birth rate among Muslim women was 5.3% which was significantly higher than among Hindu (3.5%) or Christian women (3.5%). Percentage of Muslim women was 6.6 percent. The still birth rate in Sikh women was 4.9 percent which was not statistically significant. Only 0.8 percent of women were Sikh, majority of whom were from New Delhi and Jamshedpur (Table 4.02).

Type of family

Type of family had no association with the outcome of pregnancy, with still birth rate of 3.6 and 3.8 percent among nuclear and joint families respectively (Table 4.03).

Age

Risk of still birth among women above 34 years of age was almost 3 times higher. Still birth rate of 9.7 percent among elderly women ($\geq$35 years of age) was significantly higher than among younger women (3.7%) ($p < .001$). There were only 3.0 percent women in this high risk age group of 35 years or above (Table 4.04).

Literacy

Literacy rate of mothers and fathers were 76.1 and 91.7 percent respectively. The level of education of both mother and father showed positive association with pregnancy outcome. Significantly reduction in still birth rate was observed with increase in literacy level ($p < .001$). Still birth rate was more than double in mothers with no education (6.1%) as compared to those who had college education (2.4%) (Table 4.05 & 4.06).

Working status

Still birth rate in women working as labourers (6.0%) was significantly higher when compared to still birth rate of 3.0 percent in women with regular jobs and housewives (3.7%) ($p < .01$). It is not just the nature of work but other associated factors such as poor socio-economic status and illiteracy which influence the obstetric outcome. Due to the small sample of only 88 self employed women still birth rate of 6.8 percent was not found to be significant (Table 4.07).

The occupation of father was also significant as the wives of service class men had minimum still birth rate (2.7%) as compared to wives of labourers (3.9%) or self employed (5.5%) men (Table 4.08). Self employed women as well as wives of self employed men for some reason showed highest still birth rate perhaps because they spare very little time and resources for themselves.

Habits - Consumption of tobacco or alcohol

Still birth rate among tobacco users (5.0%) was found to be significantly higher than still birth rate of 3.6 percent for women who did not use alcohol or tobacco. Of the total tobacco

users (5.2%) majority (4.9%) were tobacco chewers. Alcohol users were small in number(0.2%) for making any comparisons(Table 4.09).

OBSTETRIC PROFILE

Age at marriage

Of the total women registered, 16.3 percent women were married before the age of 17 years as compared to 15.7 percent among the women who delivered. It may be noticed that abortion rate was higher among very young and elderly women. Still birth rate had decreased significantly from 4.8 percent to 3.3 percent with increasing age at marriage upto 24 years (Table 4.10)($p<.001$). Fall in still birth rate was not significant for increase in age at marriage above 24 years. In fact, it was observed that risk of delivering a still born baby increased beyond 35 years of age (Table 4.04).

Number of previous pregnancies

Still birth rate was found to be similar for primigravidae and in women with parity upto three. There were 15524 (41.8%) women who were primigravida. Excluding these it was observed that still birth rate increased significantly from 3.3 percent for women with one or two previous pregnancies to 12.9 percent for women with more than 5 previous pregnancies ($p<.001$). Percentage of women with parity 3 or more was slightly higher among total registrations as compared to deliveries (Table 4.11). This may be due to higher rate of spontaneous abortions among multiparous women.

History of abortion

History of spontaneous or induced abortion did not show any increase in still birth rate (Tables 4.12 & 4.13). However as mentioned earlier, abortion rate was observed to be significantly higher in women who had history of spontaneous abortion.

History of still births/neonatal deaths

There were 1282 (3.5%) women who gave history of still birth in any one of the previous pregnancies of which 732 (57%) had delivered a still birth in her last pregnancy. Still birth

rate in this delivery (8.3%) was significantly higher for women who had history of still birth ($p < .001$) than for women with no such history (3.6%). Still birth rate among women who gave history of neonatal death(6.0%) was significantly higher ($p < .001$) than those who did not have history of neonatal death (3.6%) (Table 4.14 & 4.15

Contraceptive use

There were 12.3 percent women who gave history of contraceptive use prior to this pregnancy. This included 38 cases of sterilization failure, 22 tubectomies and 16 vasectomies. In this group there were 425 pregnancies due to contraceptive failure. Previous contraceptive use or contraceptive failure did not show any effect on outcome of delivery in terms of live birth or still birth (Table 4.16).

Inter-pregnancy interval

Short inter-pregnancy interval did not seem to have any adverse effect on outcome of pregnancy in terms of live birth or still birth (Table 4.17). From the delivered cases there were only 3.1 percent women who had conceived within 6 months and another 8.7 percent within one year of last pregnancy. It may be noted that short inter-pregnancy interval showed significantly higher incidence of spontaneous abortion in this study.

Outcome of last pregnancy

Excluding abortions, outcome of last pregnancy was still birth in 4.0% as compared to 3.7% in this pregnancy. Still birth rate was significantly higher(7.1%)when the last pregnancy had also ended in still birth (Table 4.18).

Antenatal Care

In this study contact between the pregnant women and any health personnel for any problem or routine check up during pregnancy has been considered as antenatal care availed. It was observed in this study that 83.2 percent women have had antenatal check up atleast once during pregnancy. Still birth rate was found to be significantly higher among women who have had no ANC (9.7%) as compared to those who had availed antenatal services (2.5%) ($p < 0.001$) (Table 4.19). Even a single antenatal check up can have a major impact in decreasing the possibility of still birth.

PROCEDURES AND OUTCOME

This section includes observations on type of delivery, induction of labour and perinatal outcome. In this series, there were 397 (1.07%) twin deliveries. Parameters concerning the neonate such as sex, birth weight,and status at discharge were noted only for the first twin.

Type of delivery

Delivery was vaginal in 86.2 percent of cases, cesarean section was done in 13.7 percent and 0.1 percent had destructive operation. Of the vaginal deliveries 74.8 percent were spontaneous vertex, 2.2 percent were delivered as breech and vacuum/forceps were used for 8.5 percent deliveries. In 238 women (0.6%) more than one vaginal procedure was carried out mainly because of twins. There were 35 cases of intrauterine death in whom destructive operations were performed (Table 4.20). Indications for vacuum/forceps delivery were prolonged labour (42.0%), foetal distress (17.4%) maternal exhaustion (5.1%) nonrotation or after coming head of breech (3.2%) and prophylactic forceps/vacuum (32.3%). Indications for abdominal delivery included, foetal distress (21.7%), previous cesarean sections (18.4%), cephalopelvic disproportion (11.8%), obstructed/prolonged labour (9.7%), antepartum haemorrhage (5.4%) malpresentation (9.2%), hypertensive disorders/eclampsia (2.3%) uterine inertia (2.1%) threatened rupture uterus (0.7%) and associated tumour/malignancy (0.2%). Cesarean section was elective in 18.5 percent. The still birth rate among cesarean sections were similar to spontaneous vaginal deliveries. The still birth rate of 20.7 percent in breech deliveries was significantly higher ($p < 0.001$). In vacuum/forceps deliveries still birth rate was lowest(1.8%) (Table 4.20).

Induction of labour

Labour was induced in 3.6 percent of women. Induction was elective in 144 women (0.39%). Other indications to induce labour were for conditions causing placental insufficiency, hypertensive disorders, antepartum haemorrhage, Rh immunization, bad obstetric history, diabetes, post-maturity, etc. There were 66 cases of intra-uterine death. Still birth rate among the total induction cases works out to be 8.6 percent as compared to

3.5 percent in whom labour was not induced. After excluding 66 cases of intrauterine deaths, still birth rate among induction cases (3.9%) was not significantly higher than 3.5% (Table 4.21).

Sex of baby

Sex of the baby was female in 48.0 percent and male in 52 percent. Male is to female ratio was 1000:923. Still birth rate was similar among male and female foetuses. There were 25 cases of ambiguous sex of which 5 (20.0%) were still born (Table 4.22).

Birth weight

In this study 26.0 percent babies were low birth weight (<2500 gms). Of these 6.8 percent weighed less than 2000 gms., 7.8 percent weighed between 2000 to 2249 gms. and 11.4 percent weighed 2250 gms. to 2499 gms. at birth. Overall average weight was found to be 2680 gms. Birth weight was not recorded in 244 babies of which 146 (59.8%) were still births. Still birth rate decreased significantly ($p < .001$) with increase in birth weight from less than 2000 gms. to 2500 gms. or more. Still birth rate for babies weighing 2250-2499 gms. (2.1%) was about one and half times more than for normal weight babies. Threefold increase in still birth rate was observed for babies weighing 2000-2249 gms. (6.3%) and a further increase of still birth rate to almost fourfold for babies weighing below 2000 gms. (24.1%) (Table 4.23). Effect of demographic and obstetric factors on birth weight has been discussed later.

Congenital malformations

A total of 347 women delivered babies with congenital malformation out of 37120 deliveries giving a congenital malformation rate of 9.3/1000 deliveries. Of the 347 babies with congenital malformation, 110 (31.7%) were still births. The congenital malformation rate among still births was 8.0 percent. 29 babies with congenital malformations (8.4%) died in the hospital before they were discharged. Hydrocephalus (73) and anencephaly (48) were the commonest congenital malformations reported. Cleft lip/palate (48) and Talipes equinovarous (44) were the commonest minor malformations. Multiple congenital malformations were reported

in 31 babies out of which 15 babies were still born and another 5 babies died before being discharged from hospital. Other malformations that were reported were congenital heart disease, tracheo-oesophageal fistula, imperforate anus, omphalocele, spina bifida, etc. (Table 4.24).

NEONATAL DEATHS

In addition to 1380 still births, 767 (2.1%) babies died before discharge from the hospital, bringing the total perinatal loss to 5.8 percent. The survival rate of neonates improved significantly ($p<.001$) with increase in birth weight. The risk of early neonatal death was more than eight times for babies weighing less than 2000 gms. compared to babies weighing 2001-2249 gms. The risk of death reduced to one third for babies weighing 2250-2499 gms., and further to two third for normal weight babies (Table 4.25). Early neonatal deaths were found to be significantly higher among neonates of young (<20 years) and elderly (≥ 35 years) mothers ($p<.05$). Level of education also plays an important role in influencing the perinatal mortality. Perinatal deaths decreased with increase in education of parents. Early neonatal deaths were found to be significantly higher in babies born to women coming from villages and from city slums. It was lowest for women coming from towns. These differences were statistically significant ($p<.05$). On the whole pregnancy outcome seemed to be better for women coming from towns (Table 4.26). Bad obstetric history affected the survival rate in early neonatal period. Early neonatal mortality increased significantly with increase in parity (excluding primi) ($p<.01$). Higher neonatal loss was observed in women who had history of still birth or neonatal death or spontaneous abortion, however the difference was not statistically significant in the last group. Early neonatal loss was also significantly higher in newborns of women who had conceived within 1st year of last pregnancy. Total perinatal loss (early neonatal deaths and still births) was 6.9 percent for women who had conceived within one year of previous pregnancy as compared to 5.8 percent for women with inter-pregnancy interval longer than one year (Table 4.27) ($p<.05$). Complications at admission also play a role in outcome of delivery.

Of the total 37120 women who came for delivery to the hospital, 11795 (31.8%) women were admitted with some medical or obstetric problems. As expected, still birth rate was signifi-

cantly higher in the women, who were admitted with complications (10.0%) as compared to women who came in labour but had no complication at admission (0.8%) ($p<.001$) (Table 4.28).

Causes of early neonatal deaths

Prematurity/IUGR and respiratory distress syndrome were the major causes of early neonatal death. They constituted 55.8 percent of the total early neonatal deaths. The high rates of deaths in prematurity, low birth weight babies, would also to some extent explain the relatively high rates of septicaemia (7.8%) reported in this study. Congenital malformation and aspiration was the cause of death in 3.8 percent and 3.4 percent respectively of total early neonatal deaths. Other causes of death included diarrhoea, hypoglycemia, pneumonia, meningitis etc. In 7.8 percent of the cases no specific cause was mentioned (Table 4.29). About 46 percent of the deaths occured within 24 hours of delivery and another 13 percent occured between one to two days of birth, the remaining babies died after 2 days.

MATERNAL DEATHS

Out of 132 maternal deaths only 87 (65.4%) died during or after delivery (Excluding data from one centre). Of these 87 deaths, 24 occured in caesarean section cases and 11 in women who had caesarean hysterectomy.

Eclampsia (16) hepatitis (10), rupture uterus (11), PPH (4), APH (8) and anaemia (6) were the important causes of death in these women. Other causes included malignancy, encephalitis, obstructed labour, respiratory disorders, etc.

DISCUSSION

The study consisted of a large sample of 43550 women who were admitted during pregnancy. Data on 37120 women who came to the hospital for delivery was studied for the factors that may be associated with adverse outcome of pregnancy.

The study sample represents the urban educated population. The literacy rate was 76.1% among the women who came to the hospital for delivery compared to 60% which is the urban literacy rate for the nation[1].

Though the study was conducted in urban teaching hospitals, there were 13 percent women who came from nearby rural areas and 10 percent from smaller towns. The still birth rate was significantly high in women who came from villages and city slums.

The percentage of Muslim women who came to the hospital for delivery was 6.6 percent. The still birth rate among Muslim women (5.3%) was significantly higher than among Hindu (3.6%) or Christian women (3.5%). But the incidence of low birth weight was higher among Hindu women as compared to women from other religions.

The type of family whether nuclear or joint, showed no relation to the outcome of delivery in terms of still birth or live birth, but there were more low birth weight babies born to women who came from joint families.

The educational level of both parents had a positive association with pregnancy outcome. The risk of still birth, low birth weight and perinatal deaths decreased with increase in education. The risk of adverse reproductive outcome also was high in the very young mothers particularly those women who were married before 16 years of age. There are studies to show that female education increases the age at marriage and the use of contraception as well as contributes towards better health by encouraging use of health facilities and adoption of sound habits of hygiene and giving adequate attention to children's welfare[2,3].

The women aged 35 years or more had higher risk of delivering still born babies. The abortion rates and other obstetric complications are also more in the older women. On the whole the outcome of pregnancy was most favourable in the parity groups 2-3. Swenson et al have also reported that early fetal wastage and still births were higher in primigravidas and grand multiparous[4].

Women working as labourers showed higher incidence of still birth or low birth weight babies as compared to women in regular service. Inadequate diet and high energy expenditure associated with physical activity competes with the demands of the growing foetus, resulting in low birth weight babies[5].

A higher rate of still births (4.9%) was observed in tobacco and/or alcohol users as compared to women who did not use them (3.6%).

Women with previous history of adverse reproductive outcomes showed a higher incidence of abortions, still births and early neonatal deaths in current pregnancy. Other authors have also reported a strong relationship between previous pregnancy history and outcome of current pregnancy[6,7].

Inter pregnancy interval did not show any association with still births in this study but the early neonatal loss was higher when interpregnancy interval was less than one year. Fredrick et al have found that when maternal age, social class and previous pregnancy outcome were accounted for, the length of interpregnancy interval had no effect on still birth rates. Neonatal death rates were however found to be high with very short interpregnancy interval ($\leq$6 months) and they attributed this to causes associated with short gestation and growth retardation[8].

With regard to antenatal care although the study showed that 83.2 percent of women who came to hospital had antenatal care, the still birth rate (9.7%) was significantly higher in the women who had no antenatal care as compared to those who had antenatal care (2.5%). It may be mentioned here, that in this study, any woman who had contact with physician anywhere at least once, was taken as having had antenatal care. This shows that even a single contact with health personnel has significant influence on obstetric outcome.

Labour was induced in 3.6 percent of women who delivered in these hospitals. Postmaturity, BOH, HDP and elective inductions were the common indications.

Still birth rates were highest among breech deliveries (20.7%) and least in vacuum/forceps deliveries (1.8%). Breech babies are more likely than other babies to have congenital abnormalities and low birth weight especially at earlier gestations[9,10,11].

The male to female sex ratio, in hospital deliveries was 1000:923 comparable to 1000:934 in 1981 census. Although perinatal mortality has been reported to be consistently higher in males than in females in other studies, this study did not show any association of sex with either still birth or early neonatal loss[12,1]

The rate of still birth decreased significantly with increase in birth weight. The factors that are associated with birth weight are discussed in a later chapter of this report.

The congenital malformation rates (both major and minor) in this study was 9.3/1000 deliveries. I.C. Verma et al reports hospital incidence of congenital malformations to vary from 8.6 in Bombay to 36.0 in Chandigarh with a mean major malformation rate of 20.2 per 1000 births[14]. The mean congenital malformation rate in still births 80/1000 was also considerably less in this study than reported by I.C. Verma (124/1000)[14].

The perinatal mortality (in this study considered as still births and deaths during hospital stay) was high in the young and elderly, illiterate mothers and those with previous reproductive loss. Increasing parity also contributed. Similar findings have been reported by others[15,16].

Age, parity, literacy and occupation of mother, play an important role in influencing outcome of pregnancy. Short inter-pregnancy interval, previous reproductive losses and absence of antenatal care significantly increased the perinatal loss.

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TABLE 4.01: OUTCOME OF DELIVERY - RESIDENCE

Residence	Outcome				Total Delive-ries	Total Regis-tration
	Live Birth		Still Birth			
	No.	Rate %	No.	Rate%		
City	22878	97.1	679	2.9	23557 (63.6)	27472 (63.2)
City Slum	4725	95.9	200	4.1	4925 (13.3)	5778 (13.3)
Town	3804	96.7	130	3.3	3934 (10.6)	4487 (10.3)
Village	4259	92.2	362	7.8	4621 (12.5)	5713 (13.1)
N.K.	74	-	9	-	83	100
Total	35740	96.3	1380	3.7	37120	43550

Figures in parentheses are column percentages

TABLE 4.02: OUTCOME OF DELIVERY - RELIGION

Religion	Outcome				Total Deliveries	Total Registration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
Hindu	32048	96.4	1195	3.6	33243 (89.6)	38917 (89.3)
Muslim	2336	94.7	131	5.3	2467 (6.6)	2957 (6.8)
Christian	922	96.5	33	3.5	955 (2.6)	1131 (2.6)
Sikhs	269	95.1	14	4.9	283 (0.8)	339 (0.8)
Others	165	95.9	7	4.1	172 (0.5)	206 (0.5)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.03: OUTCOME OF DELIVERY - TYPE OF FAMILY

Type of Family	Outcome				Total Deliveries	Total Registration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
Nuclear	16732	96.4	618	3.6	17350 (47.1)	20544 (47.5)
Joint	18742	96.2	749	3.8	19491 (52.9)	22640 (52.5)
N.K.	266		13		279	366
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.04: OUTCOME OF DELIVERY - AGE

Age (Yrs)	Outcome				Total Deliveries	Total Registration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
≤19	3669	96.9	117	3.1	3786 (10.2)	4474 (10.3)
20-34	31048	96.3	1152	3.7	32200 (86.7)	37808 (86.9)
≥35	1011	90.3	109	9.7	1120 (3.0)	1240 (2.8)
N.K.	12	-	2	-	14	28
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.05: OUTCOME OF DELIVERY-EDUCATION(MOTHER)

Education	Outcome				Total Deli-veries	Total Regis-tration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
Nil	8345	93.9	544	6.1	8889 (23.9)	10831 (24.9)
Primary	10328	96.4	388	3.6	10716 (28.9)	12493 (28.6)
Higher Secondary	12974	97.4	348	2.6	13322 (35.9)	15471 (35.5)
College & Above	4093	97.6	100	2.4	4193 (11.3)	4755 (10.9)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.06: OUTCOME OF DELIVERY-EDUCATION(FATHER)

Education	Outcome				Total Deliveries	Total Registration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
Nil	3184	92.6	254	7.4	3438 (9.3)	4235 (9.7)
Primary	7510	95.2	378	4.8	7888 (21.3)	9388 (21.6)
Higher Secondary	15764	96.7	538	3.7	16302 (43.9)	19098 (43.9)
College & Above	9282	97.8	210	2.2	9492 (25.6)	10829 (24.9)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.07: OUTCOME OF DELIVERY-WORKING STATUS OF MOTHER

Working Status	Outcome				Total Deliveries	Total Registration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate %		
Labourer	749	94.0	48	6.0	797 (2.1)	1039 (2.4)
Service	1799	97.0	55	3.0	1854 (5.0)	2165 (5.0)
Self Employed	82	93.2	6	6.8	88 (0.2)	104 (0.2)
Housewife	33110	96.3	1271	3.7	34381 (92.6)	40242 (92.4)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.08: OUTCOME OF DELIVERY-OCCUPATION OF FATHER

Occupation	Outcome				Total Deli-veries	Total Regis-tration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
Labourer	18276	96.1	737	3.9	19013 (51.2)	22479 (51.6)
Service	12156	97.3	343	2.7	12499 (33.7)	14460 (33.2)
Self Employed	4487	94.5	259	5.5	4746 (12.8)	5537 (12.7)
Unemployed	821	95.2	41	4.8	862 (2.3)	1074 (2.5)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.09:OUTCOME OF DELIVERY-CONSUMPTION OF ALCOHOL/TOBACCO

Habits	Outcome				Total Deli-veries	Total Regis-tration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
Alcohol Alone	23	95.8	1	4.2	24 (0.1)	31 (0.1)
Tobacco Alone	1791	95.0	94	5.0	1885 (5.1)	2297 (5.3)
Both	41	95.3	2	4.7	43 (0.1)	52 (0.1)
None	33885	96.4	1283	3.6	35168 (94.7)	41170 (94.5)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.10: OUTCOME OF DELIVERY-AGE AT MARRIAGE

Age at Marriage(Yrs)	Outcome				Total Deliveries	Total Registration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
≤16	5552	95.2	282	4.8	5834 (15.7)	7102 (16.3)
17-19	13851	96.2	545	3.8	14396 (38.8)	16949 (38.9)
20-24	13329	96.7	457	3.3	13786 (37.2)	15932 (36.6)
≥25	2992	96.9	95	3.1	3087 (8.3)	3547 (8.2)
N.K.	16		1		17	20
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.11:OUTCOME OF DELIVERY-NO.OF PREVIOUS PREGNANCIES

No.of Prev. Pregnancies	Outcome				Total Deli-veries	Total Regis-tration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
0	14997	96.6	527	3.4	15524 (41.8)	17894 (41.1)
1-2	16168	96.7	544	3.3	16712 (45.0)	19422 (44.6)
3-5	4278	94.2	265	5.8	4543 (12.2)	5734 (13.2)
>5	297	87.1	44	12.9	341 (0.9)	500 (1.1)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.12: OUTCOME OF DELIVERY-H/O OF SPONT.ABORTION

History of Spont.Abortion	Outcome				Total Deli-veries	Total Regis-tration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
No	32372	96.3	1238	3.7	33610 (90.6)	39004 (89.5)
Yes	3368	96.0	142	4.0	3510 (9.4)	4546 (10.5)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.13: OUTCOME OF DELIVERY-H/O OF INDUCED ABORTIONS

History of Induc.Abortion	Outcome				Total Deli-veries	Total Regis-tration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
No	35064	96.3	1361	3.7	36425 (98.1)	42693 (98.0)
Yes	676	97.3	19	2.7	695 (1.9)	857 (2.0)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.14: OUTCOME OF DELIVERY-H/O OF STILL BIRTH

History of Still Birth	Outcome				Total Deli-veries	Total Regis-tration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
No	34565	96.4	1273	3.6	35838 (96.5)	41944 (96.3)
Yes	1175	91.7	107	8.3	1282 (3.5)	1606 (3.7)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.15: OUTCOME OF DELIVERY-HISTORY OF NEONATAL DEATHS

History of Neonatal Deaths	Outcome				Total Deliveries	Total Registration
	Live Births		Still Births			
	No.	Rate%	No.	Rate%		
No	34237	96.4	1284	3.6	35521 (95.7)	41571 (95.5)
Yes	1503	94.0	96	6.0	1599 (4.3)	1979 (4.5)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.16: OUTCOME OF DELIVERY-PREVIOUS USE OF CONTRACEPTIVES

Contraceptive Used	Outcome				Total Deliveries	Total Registration
	Live Births		Still Births			
	No.	Rate%	No.	Rate%		
None	31293	96.1	1272	3.9	32565 (87.7)	38367 (88.1)
IUD	432	98.0	9	2.0	441 (1.2)	504 (1.2)
Sterilization	37	97.4	1	2.6	38 (0.1)	52 (0.1)
Others	3978	97.6	98	2.4	4076 (11.0)	4627 (10.6)
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.17: OUTCOME OF DELIVERY-INTERPREGNANCY INTERVAL(MTHS)

Inter-pregnancy Interval (Mths)	Outcome				Total Deli-veries	Total Regis-tration
	Live Births		Still Births			
	No.	Rate%	No.	Rate%		
≤6	636	95.9	27	4.1	663 (3.1)	929 (3.6)
7 - 12	1768	95.8	78	4.2	1846 (8.7)	2507 (9.8)
13 - 24	7279	96.5	267	3.5	7546 (35.5)	8949 (34.9)
≥25	10707	95.8	465	4.2	11172 (52.6)	13274 (51.7)
N.A/N.K.	15350		543		15893	17891
Total	35740	96.3	1380	3.7	37120	43550

TABLE 4.18: OUTCOME OF DELIVERY-OUTCOME OF LAST PREGNANCY

Outcome of last Pregnancy	Outcome				Total Deliveries	Total Registration
	Live Birth		Still Birth			
	No.	Rate%	No.	Rate%		
Abortion	2896	96.1	117	3.9	3013 (14.2)	3903 (15.2)
Live Birth	16832	96.2	666	3.8	17498 (82.4)	20787 (81.0)
Still Birth	680	92.9	52	7.1	732 (3.4)**	969 (3.8)
N.A/N.K.	15332	96.6	545	3.4	15877	17891
Total	35740	96.3	1380	3.7	37120	43550

**Excluding abortions percentage of still birth was 4.0

TABLE 4.19: OUTCOME OF DELIVERY - ANTENATAL CARE

ANC	Outcome				
	Live Birth		Still Birth		Total Deliveries
	No.	Rate%	No.	Rate%	
Yes	30107	97.5	778	2.5	30885 (83.2)
No	5633	90.3	602	9.7	6235 (16.8)
Total	35740	96.3	1380	3.7	37120

TABLE 4.20: OUTCOME OF DELIVERY - TYPE OF DELIVERY

Type of Delivery	Outcome				Total Deliveries
	Live Birth		Still Birth		
	No.	Rate%	No.	Rate%	
Spont.Vertex	26849	96.7	902	3.3	27751 (74.8)
Breech	661	79.3	173	20.7	834 (2.2)
Vacuum/Forceps	3107	98.2	59	1.8	3166 (8.5)
LSCS	4916	96.5	180	3.5	5096 (13.7)
Destructive	-	-	35	100.0	35 (0.1)
Others	207	87.0	31	13.0	238 (0.6)
Total	35740	96.3	1380	3.7	37120

WH-105
N90

TABLE 4.21:OUTCOME OF DELIVERY-INDICATIONS FOR INDUCTION

Indication for induction of labour	Outcome				Total Deliveries
	Live Birth		Still Birth		
	No.	Rate%	No.	Rate%	
Placental insufficiency	96	98.0	2	2.0	98
Hypertensive disorders	173	92.0	15	8.0	188
Intrauterine death	-	-	66	100.0	66
Antepartum Haemorrhage	49	84.5	9	15.5	58
Rh-ve	21	100.0	-	-	21
BOH	207	93.2	15	6.8	222
Diabetes	12	100.0	-	-	12
Post Maturity	521	98.7	7	1.3	528
Elective	143	99.3	1	0.7	144
Total Induction cases	1222	91.4	115	8.6	1337 (3.6)
No Induction	34518	96.5	1265	3.5	35783 (96.4)
Total	35740	96.7	1380	3.7	37120

TABLE 4.22: OUTCOME OF DELIVERY - SEX OF BABY

Sex of Baby	Outcome				Total Deliveries
	Live Birth		Still Birth		
	No.	Rate%	No.	Rate%	
Female	17027	96.3	646	3.7	17673 (48.0)
Male	18462	96.4	695	3.6	19157 (52.0)
Ambiguous	20	80.0	5	20.0	26 (0.06)
N.K.	231	87.2	34	12.8	265
Total	35740	96.3	1380	3.7	37120

M:F = 1000 : 923

TABLE 4.23: OUTCOME OF DELIVERY-BIRTH WEIGHT OF BABY

Birth Weight(gms.)	Outcome				Total Deliveries
	Live Birth		Still Birth		
	No.	Rate%	No.	Rate%	
<2000	1908	75.9	607	24.1	2515 (6.8)
2000-2249	2679	93.7	179	6.3	2858 (7.8)
2250-2499	4106	97.9	90	2.1	4196 (11.4)
2500-3499	25014	98.7	329	1.3	25343 (68.7)
≥3500	1935	98.5	29	1.5	1964 (5.3)
N.K.	98	40.2	146	59.8	244
Total	35740	96.3	1380	3.7	37120

TABLE 4.24: OUTCOME OF DELIVERY-CONGENITAL MALFORMATIONS

Type of Malformation	Outcome			Total
	Still Birth No.	Live Birth No.		
Cleft lip/palate	9	39	(1)	48
Talipes Equinovarous	5	39	(2)	44
Syndactyly	-	12		12
Polydactyly	-	18		18
Congenital Dislocation of hip	-	2		2
Micrognathia	-	2		2
Hydrocoele	1	5		6
Other minor malformations		13		13
Hydrocephalus	23	50	(3)	73
Anencephaly	45	3	(3)	48
Spina bifida	7	13	(1)	20
Congenital Heart Disease	1	11	(8)	12
Tracheo-oesophageal fistula	1	7	(4)	8
Imperforate anus	-	5	(1)	5
Omphalocoele	3	2	(1)	5
Multiple Congenital Malformations	15	16	(5)	31
Nil	1270	35503	(738)	36773
Total	1380	35740	(767)	37120

Figures in parentheses indicate number of babies who died during hospital stay.

TABLE 4.25: EARLY NEONATAL DEATHS DURING HOSPITAL STAY BY BIRTH WT.

Birth Weight(gms.)	Status at Discharge: Alive No.	Alive Rate %	Died No.	Died Rate%	Total Live Births	Total Deliveries
<2000	1415	74.2	493 (64.3)	25.8	1908 (5.3)	2515 (6.8)
2001-2249	2601	97.1	78 (10.2)	2.9	2679 (7.5)	2858 (7.8)
2250-2499	4069	99.1	37 (4.8)	0.9	4106 (11.5)	4196 (11.4)
2500-3499	24873	99.4	141 (18.4)	0.6	25014 (70.0)	25343 (68.7)
>= 3500	1925	99.5	10 (1.3)	0.5	1935 (5.4)	1964 (5.3)
N.K.	90	-	8 (1.0)	-	98	244
Total	34973	97.9	767	2.1	35740	37120

TABLE 4.26: PERINATAL OUTCOME-DEMOGRAPHIC FACTORS

	Died during Hospital stay No.	Rate%	Still Births Rate %	Perinatal Mortality Rate %	Total Deliveries
AGE					
< 20	108	2.9	3.1	6.0	3786
20-34	628	2.0	3.6	5.6	32200
≥35	31	2.8	9.7	12.5	1120
EDUCATION					
Nil	255	2.9	6.1	9.0	8889
Primary	244	2.3	3.6	5.9	10716
Higher Secondary	210	1.6	2.6	4.2	13322
College or above	58	1.4	2.4	3.8	4193
RESIDENCE					
City	451	1.9	2.9	4.8	23557
City slum	119	2.4	4.1	6.5	4925
Town	44	1.1	3.3	4.4	3934
Village	152	3.3	7.8	11.1	4621
RELIGION					
Hindu	688	2.1	3.6	5.7	33243
Muslim	50	2.0	5.3	7.3	2467
Others	29	2.1	3.8	5.9	1410
Total Cases	767	2.1	3.7	5.8	37120

TABLE 4.27: PERINATAL DEATHS-OBSTETRIC FACTORS

	Died during Hospital stay No.	Rate%	Still Births Rate %	Perinatal Mortality Rate %	Total Deliveries
No.of Previous Pregnancies					
0	340	2.2	3.4	5.6	15524
1-2	302	1.8	3.3	5.1	16712
3-5	114	2.5	5.8	8.3	4543
>5	11	3.2	12.9	16.1	341
H/O Spont.Abortion					
No	673	2.0	3.7	5.7	33610
Yes	94	2.7	4.0	6.7	3510
H/O Still Birth					
No	701	1.7	3.6	5.3	35838
Yes	66	4.1	8.3	12.4	1282
H/O Neonatal Death					
No	706	1.7	3.6	5.3	35521
Yes	61	3.1	6.0	9.1	1599
Inter preg. Interval					
<12 months	67	2.7	4.2	6.9	2509
⩾12 months	356	1.9	3.9	5.8	18718
N.A.	344	-	-	-	15893
Outcome of last preg.					
Abortion	77	2.6	3.9	6.5	3013
Still Birth	322	3.7	7.1	10.8	732
Live Birth	27	1.8	3.8	5.6	17498
N.A.	341	-	-	-	15877
Antenatal Care					
Yes	473	1.5	2.5	4.0	30885
No	294	4.7	9.7	14.4	6235
Total	767	2.1	3.7	5.8	37120

TABLE 4.28: OUTCOME OF PREGNANCY - IN RELATION TO COMPLICATIONS AT ADMISSION

Medical or Obstetric Complication Present at Admission	Outcome				Total Deliveries
	Live Birth		Still Birth		
	No.	Rate%	No.	Rate%	
Yes	10619	90.0	1176	10.0	11795
No	25121	99.2	204	0.8	25325
Total	35740	96.3	1380	3.7	37120

TABLE 4.29: CAUSES OF EARLY NEONATAL DEATHS

Cause of Death	No.	Percent
Respiratory distress syndrome	102	13.3
Prematurity/IUGR	326	42.5
Birth Asphyxia	131	17.1
Jaundice	8	1.0
Septicaemia	60	7.8
Aspiration	26	3.4
Congenital Malformation	29	3.8
Others	25	3.3
Not Specified	60	7.8
Total	767	100.0

ANTEPARTUM HAEMORRHAGE

Antepartum haemorrhage is most often due to premature seperation of placenta and placenta praevia. Extraplacental factors can lead to bleeding in a small proportion of cases. APH is associated with high rate of complications in both mother and foetus. Although the maternal mortality has substantially reduced with current obstetric care, the perinatal mortality in APH remains very high. The factors associated with APH and their relation to outcome of delivery were studied.

OBSERVATIONS

There were 698 women who were admitted with APH giving an incidence of 1.88 percent. APH attributed to 14.2 percent of total still births in this study. Still birth rate among cases of APH was 28.1 percent as compared to total of 3.7 percent (Table 5.01). Moreover 9.3 percent neonates died before discharge from hospital and thus giving a perinatal loss of 37.4 percent. Occurence of APH was studied in relation to demographic and obstetric factors.

Demographic factors

Age

The incidence of APH increased significantly with increase in age ($p < .001$) from 0.71 percent for women below 20 years to 5.35 percent in women 35 years or over. The direct effect of age on still birth rate is less pronounced in APH cases compared to total cases, as still birth in APH increased by one and half times (29.6% for <20 yrs. to 38.3% for 35 years or above) compared to three fold increase in total cases (3.1% to 9.7%)(Table 5.02).

Residence

The rate of APH was significantly higher among women coming from village (3.13%) as compared to women coming from town (2.38%) ($p < 0.05$) as perhaps larger number of risk cases come to city hospitals from nearby towns and villages. Though rate of APH was higher in women from villages, still birth rate and early neonatal deaths for APH cases was similar to women from city slums (S.B.37.9% & 37.5%, neonatal deaths 8.3% & 8.3%) respectively (Table 5.03).

Religion

The incidence of APH was higher in Muslims (2.79%) compared to Hindus (1.75%). Still birth rate (40.6%) and early neonatal death (10.1%) among Muslim women was significantly higher for APH cases ($p<0.05$) (Table 5.04).

Education

When compared to literate, the incidence of APH was seen to be higher among illiterate (2.43%) ($p<.05$) women. There were 30.9 percent with no education among APH cases as compared to 23.9 percent in total deliveries. Education had shown positive effect on outcome of delivery in APH cases as well as total cases. Still birth rate and early neonatal deaths decreased significantly from 31.7 and 14.0 percent to 9.1 and 3.9 percent respectively in APH cases with increase in education from primary level to college level (Table 5.05).

Obstetric factors

Total No. of Pregnancies

The rate of APH increased significantly with parity, from 1.26 percent in primigravidas to 6.74 for grand multiparous women. Increase in still birth rate with increase in number of pregnancies from 1 or 2 to more than 5 pregnancies for total deliveries was from 3.3 percent to 12.9 percent as compared to 26.3 percent to 43.5 percent for APH cases showing the combined effect of APH and higher parity on still birth rate. There were 3.3 percent women with parity more than five among APH cases as compared to only 0.9 percent women among total deliveries($p<.01$)(Table 5.06).

History of spontaneous abortions

Risk of antepartum haemorrhage was found to be significantly higher ($p<.05$) among women who had a history of spontaneous abortion (2.51%) as compared to those with no history of spontaneous abortion (1.81%), however this did not seem to affect outcome of pregnancy. Still birth rate and early neonatal deaths were not found to be affected by history of abortion in APH cases or in total delivery cases (Table 5.07).

Inter pregnancy interval

Short inter pregnancy interval did not seem to have any association with occurence of APH. Rate of APH was slightly higher in women who had conceived within 6 months of last pregnancy (3.01%) as compared to who had conceived within 7-12 months (2.16%), between one to two years (2.09%) or after two years (2.41%) (Table 5.08). The differences were not statistically significant. In case of APH also short inter pregnancy interval did not seem to attribute to higher still birth rate.

Outcome of last pregnancy

The incidence of APH was 2.32 percent, 2.86 percent, and 2.29 percent in women in whom outcome of last pregnancy was abortion, still birth or live birth respectively. At the same time it may be noted that incidence of APH was significantly less in primigravid women (1.29%) as compared to all others (Table 5.09). Among the APH cases only 29.4 percent were primigravida as compared to 42.8 percent among total deliveries.

Procedure of delivery

Induction of labour

Labour was induced in 5.4 percent of APH cases as compared to 3.6 percent for total deliveries ($p < .05$) (Table 5.10).

Type of delivery

Fifty percent of the APH cases had spontaneous vaginal delivery as compared to 74.8 percent among total deliveries. Among the APH cases 40.5 percent women had caesarean section as compared to 13.7 percent for total deliveries($p < .01$)(Table 5.11).

Birth weight

Rate of low birth weight babies was significantly higher among APH cases (54.7%) as compared to total (26.0%). The percentage of babies weighing between 2250-2499 gms. was similar for APH cases and total deliveries. Major difference was in babies weighing below 2250 gms. Among APH cases 44.1 percent weighed less than 2250gms.compared to 14.6 percent for total (Table 5.12). Low birth weight has been a major contributor to perinatal loss.

Maternal deaths

There were 9 maternal deaths (15.3/1000 deliveries). Out of a total of 588 cases admitted for APH (excluding data from one centre). Eight of these women died during delivery and one woman before delivery. There were a total of 87 maternal deaths during delivery in this study, thus approximately 10 percent of deaths were accounted for by APH.

DISCUSSION

Antepartum haemorrhage is a major obstetric problem carrying a high risk to both mother and foetus. The incidence of APH in this study was 1.88 percent. This included accidental haemorrhage, placenta praevia and other causes. Palaniappan et al[1] report an incidence of 1.1 percent for accidental haemorrhage. The study showed increased incidence of APH with increase in age and parity. A higher incidence was also seen in women coming from villages and in Muslims. In educated women the incidence of APH was less than among the illiterate. The outcome of delivery also was more favourable in the women who were educated in APH cases. The still birth rate was 28.1 percent in APH cases as compared to 3.3 percent in women with no APH. Another 9.3 percent babies died in the hospital in APH cases compared to 1.9 percent in women with no APH. It was not possible in this study to compare the outcome of delivery seperately in accidental haemorrhage and placenta praevia. Some authors quote still birth rates as high as 55 percent in accidental haemorrhage[2]. With regard to maternal deaths, the study showed that approximately 10 percent of deaths during delivery (excluding abortions) were due to APH.

Adequate antenatal care, education of patient to report to hospital when bleeding occurs, better transport facilities, early diagnosis and timely decision to conduct caesarean section will improve both foetal and maternal outcome in APH cases.

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TABLE 5.01: APH - OUTCOME OF DELIVERY

APH	Outcome				Died During Hospital stay		Total Deliveries
	Still Birth		Live Birth				
	No.	Rate%	No.	Rate%	No.	Rate%	
Yes	196 (14.2)	28.1	502	71.9	65	9.3	698 (1.88)
No	1184	3.3	35238	96.7	702	1.9	36422 (98.12)
Total	1380	3.7	35730	96.3	767	2.1	37120

Figures in parentheses are column percentages

TABLE 5.02: APH - AGE OF WOMEN

Age	Status at discharge	APH No.	APH %	Total Deliveries No.	Total Deliveries %
<20	Alive	14 (0.39)	51.8	3561	94.1
	S.B.	8 (6.83)	29.6	117	3.1
	Died	5 (4.63)	18.5	108	2.9
	Total	27 (0.71)	3.9	3786	10.2
20-34	Alive	394 (1.29)	64.5	30420	94.5
	S.B.	165 (14.32)	27.0	1152	3.6
	Died	52 (8.28)	8.5	628	2.0
	Total	611 (1.89)	87.5	32200	86.8
≥35	Alive	29 (2.95)	48.3	980	87.5
	S.B.	23 (21.10)	38.3	109	9.7
	Died	8 (25.81)	13.3	31	2.8
	Total	60 (5.35)	8.6	1120	3.0
	N.K.	-		14	
	Total	698 (1.88)		37120	

Figures in parentheses indicate rate % of APH in respective groups

Underlined figures give percentage distribution of APH and Total cases according to main variable (e.g. age).

TABLE 5.03: APH - RESIDENCE

Residence	Status at Discharge	APH No.	APH %	Total Deliveries No.	Total Deliveries %
City	Alive	235 (1.04)	65.3	22427	95.2
	S.B.	85 (12.5)	23.6	679	2.9
	Died	40	11.1	451	1.9
	Total	360 (1.52)	51.8	23557	63.6
City Slum	Alive	52 (1.12)	54.2	4606	93.5
	S.B.	36 (18.00)	37.5	200	4.1
	Died	8 (6.72)	8.3	119	2.4
	Total	96 (1.94)	13.8	4925	13.3
Town	Alive	70 (1.86)	74.5	3760	95.6
	S.B.	19 (2.30)	20.2	130	3.3
	Died	5 (11.36)	5.3	44	1.1
	Total	94 (2.38)	13.5	3934	10.6
Village	Alive	78 (1.89)	53.8	4107	88.9
	S.B.	55 (15.19)	37.9	362	7.8
	Died	12 (7.89)	8.3	152	3.3
	Total	145 (3.13)	20.9	4621	12.5
	N.K.	3		83	
	Total	698		37120	

Figures in parentheses indicate rate % of APH in respective groups

Underlined figures give percentage distribution of APH and total cases according to main variable.

TABLE 5.04: APH - RELIGION

Religion	Status at Discharge	APH No.	APH %	Total Deliveries No.	Total Deliveries %
Hindu	Alive	374 (1.19)	64.1	31360	94.3
	S.B.	155 (12.97)	26.6	1195	3.6
	Died	54 (7.84)	9.3	688	2.1
	Total	583 (1.75)	83.5	33243	89.6
Muslim	Alive	34 (1.48)	49.3	2286	92.7
	S.B.	28 (21.37)	40.6	131	5.3
	Died	7 (14.0)	10.1	50	2.0
	Total	69 (2.79)	9.9	2467	6.6
Others	Alive	29 (2.19)	63.0	1327	94.1
	S.B.	13 (24.07)	28.3	54	3.8
	Died	4 (13.79)	8.7	29	2.1
	Total	46 (3.26)	6.6	1410	3.8
	N.K.	-		-	
	Total	698		37120	

Figures in parentheses indicate rate % of APH in respective groups.

Underlined figures give percentage distribution of APH and total cases according to main variable.

TABLE 5.05: APH - EDUCATION OF MOTHER

Education	Status at Discharge	APH No.	APH %	Total Deliveries No.	Total Deliveries %
None	Alive	112 (1.38)	51.8	8090	91.0
	S.B.	85 (15.62)	39.4	544	6.1
	Died	19 (7.45)	8.8	255	2.9
	Total	216 (2.43)	30.9	8889	23.9
Primary	Alive	101 (1.00)	54.3	10084	94.1
	S.B.	59 (15.20)	31.7	388	3.6
	Died	26 (10.66)	14.0	244	2.3
	Total	186 (1.73)	26.6	10716	28.9
Higher Secondary	Alive	101 (1.23)	71.7	12764	95.8
	S.B.	45 (12.93)	20.5	348	2.6
	Died	17 (8.09)	7.8	210	1.6
	Total	219 (1.64)	31.4	13322	35.9
College & Above	Alive	67 (1.66)	87.0	4035	96.2
	S.B.	7 (7.00)	9.1	100	2.4
	Died	3 (5.17)	3.9	58	1.4
	Total	77 (1.83)	11.0	4193	11.3
	Total	698		37120	

Figures in parentheses indicate rate % of APH in respective groups.

Underlined figures give percentage distribution of APH and total cases according to main variable.

TABLE 5.06: APH - NO. OF PREGNANCIES

Total No. of Pregnancies	Status at Discharge	APH No.	APH %	Total Deliveries No.	Total Deliveries %
Nil	Alive	128 (0.87)	65.0	14657	94.4
	S.B.	49 (9.29)	24.9	527	3.4
	Died	20 (5.88)	10.1	340	2.2
	Total	197 (1.26)	28.2	15524	41.8
1-2	Alive	197 (1.24)	64.8	15866	94.9
	S.B.	80 (14.70)	26.3	544	3.3
	Died	27 (8.94)	8.9	302	1.8
	Total	304 (1.81)	43.6	16712	45.0
3-5	Alive	102 (2.44)	58.6	4164	91.6
	S.B.	57 (21.50)	32.8	265	5.8
	Died	15 (13.15)	8.6	114	2.5
	Total	174 (3.83)	24.9	4543	12.2
>5	Alive	10 (3.49)	43.5	286	83.9
	S.B.	10 (22.72)	43.5	44	12.9
	Died	3 (27.27)	13.0	11	3.2
	Total	23 (6.74)	3.3	341	0.9
	Total	698		37120	

Figures in parentheses indicate rate % of APH in respective groups.

Underlined figures give percentage distribution of APH and total cases according to main variable.

TABLE 5.07: APH - H/O OF SPONTANEOUS ABORTION

H/O Spont. Abortion	Status at Discharge	APH No.	APH %	Total Deliveries No.	Total Deliveries %
No	Alive	380 (1.20)	62.3	31699	94.3
	S.B.	174 (14.06)	28.5	1238	3.7
	Died	56 (8.47)	9.2	673	2.0
	Total	610 (1.81)	87.4	33610	90.5
Yes	Alive	57 (1.74)	64.8	3274	93.3
	S.B.	22 (15.49)	25.0	142	4.0
	Died	9 (9.57)	10.2	94	2.7
	Total	88 (2.51)	12.6	3510	9.5
	Total	698		37120	

Figures in parentheses indicate rate % of APH in respective groups.

Underlined figures give percentage distribution of APH and total cases according to main variable.

TABLE 5.08: APH - INTER PREGNANCY INTERVAL

Interval since last pregnancy	Status at Discharge	APH No.	APH %	Total Deliveries No.	Total Deliveries %
N.A.	Alive	138 (0.92)	65.7	15000	94.4
	S.B.	51 (9.39)	24.3	543	3.4
	Died	21 (6.10)	10.0	344	2.2
	Total	210 (1.32)	30.1	15893	42.8
<6	Alive	13 (2.10)	65.0	618	93.2
	S.B.	5 (18.51)	25.0	27	4.1
	Died	2 (2.26)	10.0	18	2.7
	Total	20 (3.01)	2.9	663	1.8
7 - 12	Alive	25 (1.45)	62.5	1719	93.1
	S.B.	13 (16.66)	32.5	78	4.2
	Died	2 (4.08)	5.0	49	2.2
	Total	40 (2.16)	5.7	1846	5.0
13 - 24	Alive	106 (1.48)	67.1	7116	94.3
	S.B.	32 (11.98)	20.2	267	3.5
	Died	20 (12.26)	12.7	163	2.2
	Total	158 (2.09)	22.6	7546	20.3
≥25	Alive	155 (1.47)	57.4	10514	94.1
	S.B.	95 (20.43)	35.2	465	4.2
	Died	20 (10.36)	7.4	193	1.7
	Total	270 (2.41)	38.7	11172	30.1
	Total	698		37120	

Figures in parentheses indicate rate % of APH in respective groups

Underlined figures give percentage distribution of APH and total cases according to main variable.

TABLE 5.09: APH - OUTCOME OF LAST PREGNANCY

Outcome of Pregnancy	Status at Discharge	APH No.	APH %	Total Deliveries No.	Total Deliveries %
N.A.	Alive	134 (0.89)	65.4	14986	94.4
	S.B.	51 (9.35)	24.9	545	3.4
	Died	20 (5.78)	9.8	346	2.2
	Total	205 (1.29)	29.4	15877	42.8
Abortion	Alive	50 (1.77)	71.4	2819	93.6
	S.B.	14 (11.96)	20.0	117	3.9
	Died	6 (7.79)	8.6	77	2.6
	Total	70 (2.32)	10.0	3013	8.1
Still Birth	Alive	13 (1.99)	61.9	653	89.1
	S.B.	5 (9.61)	23.8	52	7.1
	Died	3 (11.11)	14.3	27	3.7
	Total	21 (2.86)	3.0	732	2.0
Live Birth	Alive	240 (1.45)	59.7	16510	94.3
	S.B.	126 (18.92)	31.3	666	3.8
	Died	36 (11.18)	9.0	322	1.8
	Total	402 (2.29)	57.6	17498	47.1
	Total	698		37120	

Figures in parentheses indicate rate % of APH in respective groups

underlined figures give percentage distribution of APH and total cases according to main variable.

TABLE 5.10: APH - INDUCTION OF LABOUR

Induction of Labour	APH No.	APH %	Total Deliveries No.	Total Deliveries %
Yes	38 (2.84)	5.4	1337	3.6
No	660 (1.84)	94.6	35783	96.4
Total	698 (1.88)		37120	

Figures in parentheses indicate rate percent of APH in respective groups.

TABLE 5.11: APH - TYPE OF DELIVERY

Type of Delivery	APH No.	APH %	Total Deliveries No.	Total Deliveries %
Spontaneous vertex	349	50.0	27751	74.8
Breech	23	3.3	834	2.2
Vacuum/Forceps	36	5.2	3166	8.5
LSCS	283	40.5	5096	13.7
Destructive Operation	1	0.1	35	0.1
Others	6	0.9	238	0.6
Total	698		37120	

TABLE 5.12: APH - BIRTH WEIGHT

Birth Weight	Status at Discharge	APH No.	APH %	Total Deliveries No.	Total Deliveries %
<2250	Alive	106 (2.63)	35.3	4018	74.7
	S.B.	134 (17.0)	44.7	786	14.6
	Died	60 (10.50)	20.0	571	10.6
	Total	300 (5.58)	44.1	5373	14.6
2250-2499	Alive	59 (1.44)	81.9	4069	97.0
	S.B.	13 (14.44)	18.1	90	2.1
	Died	-	-	37	0.9
	Total	72 (1.71)	10.6	4196	11.4
2500-3499	Alive	255 (1.02)	87.0	24873	98.1
	S.B.	34 (10.33)	11.6	329	1.3
	Died	4 (2.83)	1.4	141	0.6
	Total	293 (1.15)	43.0	25343	68.7
≥3500	Alive	14 (0.72)	87.5	1925	98.0
	S.B.	2 (6.89)	12.5	29	1.5
	Died	-	-	10	0.5
	Total	16 (0.81)	2.3	1964	5.3
	N.K.	17		244	
	Total	698		37120	

Figures in parentheses indicate rate % of APH in respective groups.

Underlined figures give percentage distribution of APH and total cases according to main variable.

HYPERTENSIVE DISORDERS OF PREGNANCY

Hypertension complicating pregnancy is a major cause of prematurity and perinatal deaths and is responsible for about one fifth of all maternal deaths. Hypertensive disorders of pregnancy was seen in 3707 women out of 37120 deliveries, giving an incidence of 10 percent. Still birth rate among these cases was 7.6 percent as compared to 3.3 percent for others, and early neonatal deaths in the hospital was 3.7 percent compared to 1.9 percent. Perinatal loss among cases of HDP (11.3%) was significantly higher ($p < .01$) (Table 6.01). Several obstetric and demographic parameters associated with HDP were studied.

OBSERVATIONS

Age

The women who were 35 years of age or above had a higher incidence of HDP (16.3%) as compared to women in the age group 20-34 years (9.69%) or <20 years (9.13%). This trend of increase in incidence of hypertensive disorders with increasing age was statistically significant ($p < .01$). The still birth rate was significantly higher in HDP cases and the incidence of HDP was highest in women 35 years or above. However still birth rate in women 35 years or above was similar in HDP as in total cases. Early neonatal loss in hospital was higher in HDP cases in all age groups, but this was statistically significant for women upto 34 years of age (Table 6.02).

Residence

Incidence of HDP was seen to be significantly higher among women coming from towns or villages ($p < .01$). The reason may be that women with problems specially come to the cities for treatment. HDP was diagnosed in 16.11 percent and 12.70 percent of women from town and village as compared to 8.76 percent and 8.39 percent in city or city slum women respectively(Table 6.03).

Religion

Incidence of HDP was significantly lower among Hindu women (9.74%) as compared to Muslim women (11.34%) and women from other religions ($p < .05$). Muslim women (11.34%) though showed a slightly lower incidence as compared to others (13.04) the

difference was not statistically significant. Inspite of lower incidence of HDP among Hindu women still birth rate or early neonatal loss (7.4 & 3.8%) were not significantly less than in Muslim women (8.6 & 3.6%) with HDP or in women from other religions (9.8 & 2.7%) (Table 6.04).

Education of mother

Incidence of HDP among educated women was observed to be significantly higher (10.3% for literate women compared to 8.98% for illiterate) ($p < .05$), but it was only the women with college or higher level of education who contributed to this higher incidence. Among women with college education incidence of HDP was 14.30 percent. This could be due to the fact that educated women are able to recognise the risk and seek medical help. It may be observed that in this group of educated women, inspite of higher incidence of HDP the still birth rate (4.0%) and early neonatal deaths (3.0%) were lower than others (Table 6.05).

Occupation

Women in service showed a significantly higher incidence of HDP (12.67%) as compared to labourers (9.15%) and housewives (9.86%) ($p < .01$). Again still birth rates were similar for all groups except for women who were self employed. The number of self employed women with HDP (7) was very low to draw any conclusions. Although early neonatal deaths in HDP cases from service class (8.1%) were found to be significantly higher as compared to in HDP cases among housewives (3.7%) ($p < .05$). For total deliveries neonatal deaths were similar in all groups (Table 6.06).

No.of Previous Pregnancies

Risk of HDP was seen to be significantly higher for primigravida (13.01%) and grandmultiparous women (13.78%) as compared to other women ($p < .01$). However, HDP did not increase the risk of still birth or early neonatal loss significantly in hospital for the primigravida. The risk of HDP and still birth rate increased with increase in parity after excluding primigravida similar increase in still birth rate was also observed in non-HDP cases (Table 6.07).

Inter pregnancy interval

Inter pregnancy interval did not seem to influence the development of HDP. Though women who had conceived within six months of last pregnancy seem to have higher incidence of HDP (10.55%) it was not significantly higher than in women who conceived within 7-12 months (8.82%) (Table 6.08).

Outcome of last pregnancy

Women with history of still birth in last pregnancy had highest incidence of HDP (14.34%) compared to women who had abortion(11.05%). Risk of HDP was lowest in women who had live birth in last pregnancy (7.01%). These differences were statistically significant ($p < .01$). Still birth rate was highest among women who had delivered a still born baby in last pregnancy in both the groups - the HDP cases (13.3%) and total deliveries (7.1%) (Table 6.09).

Induction of labour

There were 8.9 percent of HDP cases who required induction of labour. This was significantly higher than the incidence of induction in total delivery cases (3.6%) ($p < .001$). Of the total 1337 cases of induction of labour, in 24.7 percent the indication for induction was HDP (Table 6.10).

Type of delivery

Of the women who had hypertensive disorders 63.4 percent had normal vaginal delivery as compared to 74.8 percent of total cases. Caesarean section rate was 19.5 percent and vacuum/forcep delivery was 13.2 percent among HDP cases as compared to 13.7 and 8.5 percent respectively in total cases ($p < .001$). Hypertensive disorders accounted for 722 (14.2%) of total 5096 caesarean sections in this study (Table 6.11).

Birth Weight

Rate of low birth weight was 33.8 percent in HDP cases as compared to 26.0 percent among total deliveries ($p < .001$). It was observed that percentage of babies weighing between 2250-2499 gms. was similar in HDP cases as compared to the

total. Major difference was observed for higher degree of low birth weight (<2250gms), 22.7 percent of babies weighing below 2250 gms. in HDP cases as compared to 14.6 percent in the total delivery cases (Table 6.12).

Maternal Deaths

There were 25 maternal deaths out of 3189 HDP cases, giving a mortality rate of 7.8 per 1000 deliveries (Excluding data from one centre) 16 of these deaths were due to eclampsia. On the whole there were 187 women admitted for eclampsia (5% of HDP cases) giving a mortality of 8.5 percent in eclampsia. Other causes of death in HDP cases were associated medical complications such as Jaundice, Bronchopneumonia, status asthmaticus etc.

DISCUSSION

The incidence of HDP in this study is 10 percent. D.C.Dutta quotes the hospital incidence of HDP as varying between 5-15%[1]. The risk of HDP was more in women 35 years or above and grandmultiparas. Primiparous also showed a slightly higher incidence of HDP. However among the HDP cases the still birth rate was not higher in women 35 years or above as compared to total cases, whereas HDP increases the risk of still birth in grandmultiparas. The study showed a high incidence of HDP in the educated particularly those women who were educated upto college level or higher (14.3%). Perhaps their education helped them recognise their illness and they sought medical help at participating institutions, whereas in a community based study, using education as an index of social class in Jerusalem, the pre-eclampsia rate in the illiterate women was twice the mean, when adjusted for age, parity and ethnic origin[2]. Availability of medical care and utilisation of services were not taken into account here. Risk of HDP was more in women in whom the outcome of last pregnancy was not favourable and this risk was more in women with history of still birth (14.3%) than with history of abortion (11.05%). The rate of low birth weight was higher particularly for babies weighing <2250 gms (22.7%) in HDP cases as compared to total delivery cases (14.6%). Macgillivray feels that hypertension alone has little or no effect on birth weight, particularly on primigravida, but the addition of proteinuria is associated with foetal growth lag[3]. The maternal

mortality rate in HDP in this study was 6.7 per 1000 deliveries but was higher in eclampsia patients (8.6%). The perinatal loss was 11.3 percent in women with HDP as compared to 5.2 percent in women with no HDP. Others[4] have reported a perinatal mortality of 33 percent in HDP cases.

The basic pathology of HDP is vasospasm and reduction in placental blood flow leading to foetal hypoxia followed by intrauterine growth retardation or foetal death. It is necessary to weigh the risk of growth retardation and intrauterine foetal death with the risk of neonatal death by judging the extent of foetoplacental insufficiency as well as foetal maturity, to consider induction of labour or elective caesarean section. Institutions with good facilities of biophysical assessment and intensive neonatal care would certainly show better results. Strict antenatal foetal surveillance and timely delivery followed by excellent neonatal management would reduce the perinatal loss to the minimum.

The principal causes of maternal mortality are complications such as eclampsia cerebral haemorrhage, pulmonary oedema, renal failure, abruptio placenta and DIC. As most of these problems could be avoided by timely medical management, good antenatal, intranatal and postnatal care are most rewarding. The society has to be aware of the health delivery systems and the providers of the system have to be conscientious, vigilant and efficient.

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TABLE 6.01: HYPERTENSIVE DISORDERS OF PREGNANCY-
OUTCOME OF DELIVERY

HDP	OUTCOME				Died During Hosp.stay		Total Deli-veries
	Still Birth		Live Birth				
	No.	Rate%	No.	Rate%	No.	Rate%	
Yes	283	7.6	3424	92.4	139	3.7	3707 (10.0)
No	1097	3.3	32316	96.7	628	1.9	33413 (90.0)
Total	1380	3.7	35740	96.3	767	2.1	37120

Figures in parentheses are column percentages

TABLE 6.02: HDP - AGE OF WOMEN

Age/Status at Discharge		Cases of HDP No.	%	Total Deliveries No.	%
<20	Alive	346 (9.71)	86.9	3561	94.1
	S.B.	28 (23.93)	7.0	117	3.1
	Died	24 (22.22)	6.0	108	2.9
	Total	398 (9.13)	10.7	3786	10.2
20-34	Alive	2778 (9.13)	89.0	30420	94.5
	S.B.	238 (20.65)	7.6	1152	3.6
	Died	106 (16.87)	3.4	628	2.0
	Total	3122 (9.69)	84.3	32200	86.8
≥35	Alive	157 (16.02)	85.8	980	87.5
	S.B.	17 (15.59)	9.3	109	9.7
	Died	9 (29.0)	5.0	31	2.8
	Total	183 (16.33)	4.9	1120	3.0
	N.K.	4		14	
	Total	3707 (10.0)		37120	

Underlined figures give percentage distribution of HDP and total cases according to main variable (e.g. Age).

Figures in parentheses indicate rate % HDP cases in respective groups.

TABLE 6.03: HDP - RESIDENCE

Residence/Status at Discharge		Cases of HDP No.	Cases of HDP %	Total Deliveries No.	Total Deliveries %
City	Alive	1860 (9.29)	90.1	22427	95.2
	S.B.	131 (19.29)	6.3	679	2.9
	Died	73 (16.18)	3.5	451	1.9
	Total	2064 (8.76)	55.9	23557	63.6
City Slum	Alive	351 (7.62)	85.0	4606	93.5
	S.B.	37 (18.50)	9.0	200	4.1
	Died	25 (21.00)	6.0	119	2.4
	Total	413 (8.39)	11.2	4925	13.3
Town	Alive	589 (15.66)	92.9	3760	95.6
	S.B.	32 (24.61)	5.0	130	3.3
	Died	13 (29.54)	2.0	44	1.1
	Total	634 (16.11)	17.1	3934	10.6
Village	Alive	479 (11.66)	81.6	4107	88.9
	S.B.	80 (22.09)	13.6	362	7.8
	Died	28 (18.42)	4.8	152	3.3
	Total	587 (12.70)	15.8	4621	12.5
	N.K.	9		83	
	Total	3707		37120	

Underlined figures give percentage distribution of HDP and total cases according to main variable.

Figures in parentheses indicate rate % of HDP cases in respective groups.

TABLE 6.04: HDP - RELIGION

Religion/Status at Discharge		Cases of HDP No.	Cases of HDP %	Total Deliveries No.	Total Deliveries %
Hindu	Alive	2875 (9.16)	88.8	31360	94.3
	S.B.	240 (20.08)	7.4	1195	3.6
	Died	124 (18.02)	3.8	688	2.1
	Total	3239 (9.74)	87.5	33243	89.6
Muslim	Alive	246 (10.76)	87.9	2286	92.7
	S.B.	24 (18.32)	8.6	131	5.3
	Died	10 (20.00)	3.6	50	2.0
	Total	280 (11.34)	7.6	2467	6.6
Others	Alive	161 (12.13)	87.5	1327	94.1
	S.B.	18 (33.33)	9.8	54	3.8
	Died	5 (17.24)	2.7	29	2.1
	Total	184 (13.04)	4.9	1410	3.8
	N.K.	4		-	
	Total	3707		37120	

Underlined figures give percentage distribution of HDP and total cases according to main variable.

Figures in parentheses indicate rate % of HDP cases in respective groups.

TABLE 6.05: HDP - EDUCATION OF WOMEN

Education/ Status at Discharge		Cases of HDP No.	Cases of HDP %	Total Deliveries No.	Total Deliveries %
None	Alive	666 (8.23)	83.4	8090	91.0
	S.B.	88 (16.17)	11.0	544	6.1
	Died	45 (17.64)	5.6	255	2.9
	Total	799 (8.98)	21.5	8889	23.9
Primary	Alive	886 (8.78)	87.3	10084	94.1
	S.B.	85 (21.90)	8.4	388	3.6
	Died	44 (18.03)	4.3	244	2.3
	Total	1015 (9.47)	27.4	10716	28.9
Higher Secondary	Alive	1175 (9.20)	90.9	12764	95.8
	S.B.	86 (24.7)	6.7	348	2.6
	Died	32 (15.23)	2.5	210	1.6
	Total	1293 (9.70)	34.9	13322	35.9
College & Above	Alive	558 (13.82)	93.0	4035	96.2
	S.B.	24 (24.00)	4.0	100	2.4
	Died	18 (31.03)	3.0	58	1.4
	Total	600 (14.30)	16.2	4193	11.3
	Total	3707		37120	

Underlined figures give percentage distribution of HDP and total cases according to main variable.

Figures in parentheses indicate rate percent of HDP cases in respective groups.

TABLE 6.06: HDP - OCCUPATION

Occupation/Status at Discharge		Cases of HDP No.	%	Total Deliveries No.	%
Service	Alive	209 (11.78)	88.9	1774	95.7
	S.B.	17 (30.90)	7.2	55	3.0
	Died	19 (76.00)	8.1	25	1.3
	Total	235 (12.67)	6.3	1854	5.0
Labourer	Alive	64 (8.70)	87.8	735	92.2
	S.B.	5 (10.42)	6.8	48	6.0
	Died	4 (28.57)	5.5	14	1.8
	Total	73 (9.15)	2.0	797	2.1
Self-Employed	Alive	5 (6.09)	71.4	82	93.2
	S.B.	2 (33.33)	28.6	6	6.8
	Died	-	-	-	-
	Total	7 (7.95)	0.2	88	0.2
Housewife	Alive	3007 (9.28)	88.6	32382	94.2
	S.B.	259 (20.37)	7.6	1271	3.7
	Died	126 (17.30)	3.7	728	2.1
	Total	3392 (9.86)	91.5	34381	92.6
	Total	3707		37120	

Underlined figures give percentage distribution of HDP and total cases according to main variable.

Figures in parentheses indicate rate percent of HDP cases in respective groups.

TABLE 6.07: HDP - NO.OF PREVIOUS PREGNANCIES

Total No. of Preg./ Status at Discharge		Cases of HDP No.	%	Total Deliveries No.	%
Nil	.Alive	1793 (12.23)	88.7	14657	94.4
	S.B.	149 (28.27)	7.4	527	3.4
	Died	79 (23.23)	3.9	340	2.2
	Total	2021 (13.01)	54.5	15524	41.8
1 - 2	Alive	1128 (7.10)	90.2	15866	94.7
	S.B.	84 (15.44)	6.7	544	3.3
	Died	39 (12.91)	3.1	302	1.8
	Total	1251 (7.27)	33.7	16712	45.0
3 - 5	Alive	329 (7.90)	84.8	4164	91.6
	S.B.	39 (14.71)	10.1	265	5.8
	Died	20 (17.54)	5.1	114	2.5
	Total	388 (8.54)	10.5	4543	12.2
> 5	Alive	35 (12.23)	74.5	286	83.9
	S.B.	11 (25.00)	23.4	44	12.9
	Died	1 (0.09)	2.1	11	3.2
	Total	47 (13.78)	1.3	341	0.9
	Total	3707		37120	

Underlined figures give percentage distribution of HDP and total cases according to main variable.

Figures in parentheses indicate rate % of HDP cases in respective groups.

TABLE 6.08: HDP - INTER PREGNANCY INTERVAL

Interval since last Preg./ Status at Discharge		Cases of HDP No.	%	Total Deliveries No.	%
N.A./N.K	Alive	1812 (12.08)	88.7	15000	94.4
	S.B.	152 (27.99)	7.4	543	3.4
	Died	79 (22.96)	3.9	344	2.2
	Total	2043 (12.85)	55.1	15893	42.8
≤ 6	Alive	61 (9.87)	87.1	618	93.2
	S.B.	6 (22.22)	8.6	27	4.1
	Died	3 (16.66)	4.3	18	2.7
	Total	70 (10.55)	1.9	663	1.8
7 - 12	Alive	142 (8.26)	87.1	1719	93.1
	S.B.	12 (15.38)	7.4	78	4.2
	Died	9 (18.36)	5.5	49	2.7
	Total	163 (8.82)	4.4	1846	5.0
13 - 24	Alive	467 (6.56)	90.5	7116	94.3
	S.B.	30 (11.23)	5.8	267	3.5
	Died	19 (11.65)	3.7	163	2.2
	Total	516 (6.83)	13.9	7546	20.3
≥ 25	Alive	803 (7.63)	87.8	10514	94.1
	S.B.	83 (17.84)	9.1	465	4.2
	Died	29 (15.02)	3.2	193	1.7
	Total	915 (8.19)	24.7	11172	30.1
	Total	3707		37120	

Underlined figures give percentage distribution of HDP and total cases according to main variable.

Figures in parentheses indicate rate % of HDP cases in respective groups.

TABLE 6.09: HDP - OUTCOME OF LAST PREGNANCY

Outcome of last Preg./ Status at Discharge		Cases of HDP No.	%	Total Deliveries No.	%
N.A/N.K.	Alive	1812 (12.09)	88.7	14982	94.4
	S.B.	151 (27.70)	7.4	545	3.4
	Died	79 (23.16)	3.9	341	2.1
	Total	2042 (12.86)	55.1	15877	42.8
Abortion	Alive	289 (10.25)	86.8	2819	93.6
	S.B.	25 (21.36)	7.5	117	3.9
	Died	19 (24.67)	5.7	77	2.6
	Total	333 (11.05)	9.0	3013	8.1
Still Birth	Alive	84 (12.86)	80.0	653	89.1
	S.B.	14 (26.92)	13.3	52	7.1
	Died	7 (25.92)	6.7	27	3.7
	Total	105 (14.34)	2.8	732	2.0
Live Birth	Alive	1100 (6.66)	89.6	16510	94.3
	S.B.	93 (13.96)	7.6	666	3.8
	Died	34 (10.55)	2.8	322	1.8
	Total	1227 (7.01)	33.1	17498	47.1
	Total	3707		37120	

Underlined figures give percentage distribution of HDP and total cases according to main variable.

Figures in parentheses indicate rate % of HDP cases in respective groups.

TABLE 6.10: HDP - INDUCTION OF LABOUR

Induction of Labour	Cases of HDP No.	%	Total Deliveries No.	%
Yes	330 (24.7)	8.9	1337	3.6
No	3377	91.1	35783	96.4
Total	3707		37120	

TABLE 6.11: HDP - TYPE OF DELIVERY

Type of Delivery	Cases of HDP		Total Deliveries	
	No.	%	No.	%
Spontaneous Vertex	2350	63.4	27751	74.8
Breech	87	2.3	834	2.2
Vacuum/Forceps	491	13.2	3166	8.5
LSCS	722	19.5	5096	13.7
Destructive	4	0.1	35	0.1
Others	53	1.4	238	0.6
Total	3707		37120	

TABLE 6.12: HDP - BIRTH WEIGHT

Birth Weight	Cases of HDP		Total Deliveries	
	No.	%	No.	%
< 2250	828 (15.41)	22.7	5373	14.6
2250-2499	405 (9.55)	11.1	4196	11.4
2500-3499	2205 (8.70)	60.3	25343	68.7
≥ 3500	217 (11.05)	5.9	1964	5.3
N.K.	52 (21.31)	-	244	-
Total	3707 (9.99)		37120	

Figures in parentheses indicate rate percent of HDP cases in respective group.

PREMATURE LABOUR

Preterm labour is painful uterine contractions with progressive dilatation and effacement of the cervix before 37 weeks of gestation. The foetus has the best chances of survival and normal development in utero. Even a two week prolongation of gestation can improve the foetal outcome and long term development of prematurely born infants. Though mechanism of onset of labour is not yet fully understood, several factors play a role. An attempt has been made to study the significance of obstetric and demographic factors which result in premature delivery. There were 1542 women in this study who were admitted with premature labour out of a total of 37120 deliveries giving an incidence of 4.15 percent.

OBSERVATIONS

Age

The risk of premature labour was significantly higher ($p<.01$) in women aged 20 years or less (5.20%) as compared to women in the age groups 20-34 years (4.03%) or 35 years or above (4.10%) (Table 7.01).

Residence

In women who came to the hospital from towns, premature labour was seen in only 1.19 percent women. This was significantly less than the premature labour rate in women coming from villages (5.56%) or from cities (4.41%) ($p<.01$). The rate of premature labour in city slums (3.91%) was similar to that in cities (4.41%) (Table 7.02).

Education

The incidence of premature labour was 7.0 percent in illiterate women. Premature labour was significantly less among the literate ($p<.01$) but the level of education did not influence the incidence (Table 7.03).

Occupation

Women working as labourers had the highest rate of premature labour (6.77%) as compared to the rates in housewives (4.12%) or women in regular service (3.61%) (Table 7.04). This difference was statistically significant ($p<.05$).

Religion

The rate of premature labour was significantly higher ($p<.05$) in Hindus (4.27%) as compared to 3.28 percent in Muslims and 2.9 percent in women from other religions (Table 7.05).

Total No. of pregnancies

In primigravida, the rate of premature labour was 4.35 per 100 deliveries. If we exclude primigravida, the rate of prematurity increased with increase in parity. It was 3.79 percent in women with 1-2 pregnancies and was almost double (6.15%) in women with more than 5 pregnancies ($p<0.01$) (Table 7.06).

Interval since last pregnancy

Women with short interpregnancy interval (<12 months) are at a higher risk of going into premature labour as compared to women with interpregnancy interval of more than a year. The rate of premature labour was 5.62 percent in women with interpregnancy interval <12 months as compared to 4.53 and 3.32 percent in women in whom the interpregnancy interval was 13-24 months and ≥ 25 months respectively ($p<0.01$) (Table 7.07).

Outcome of pregnancy

The chances of a woman going into premature labour was significantly higher when the outcome of last pregnancy was still birth (8.19%) or an abortion (5.07%) as compared to women who had given birth to a live baby (3.66%) in the last pregnancy ($p<.01$) (Table 7.08).

History of previous spontaneous abortion

The incidence of premature labour increases with increase in the number of spontaneous abortion. It was 3.83 percent in women with no history of abortion. This increased to 4.74 percent in women with history of one previous spontaneous abortion and to 5.38 percent in women with 2 or more spontaneous abortions ($p<.01$) (Table 7.09).

Type of Delivery

There were more breech deliveries (6.6%) in women who went into premature labour than among the total deliveries (2.2%) (Table 7.10).

Status at Discharge

A total of 767 babies died during hospital stay of which prematurity was the cause in 246 babies. The overall perinatal mortality rate in premature deliveries was 26 per 100 deliveries as compared to 5.78 in total deliveries (Table 7.11).

DISCUSSION

Preterm delivery is a major obstetric and public health problem as it contributes to between 50-70 percent of all perinatal deaths[1]. In this study prematurity was the commonest cause (42.5%) of deaths in newborn infants during hospital stay. The rate of occurrence of premature labour was 4.15 percent. This is considerably less than the incidence of premature labour in another ICMR hospital based study (unpublished) which gives an incidence of 9.5 percent on the basis of period of gestation at delivery[2]. In this study incidence of premature labour is based on clinical diagnosis at admission. Other Indian authors quote incidence of prematurity between 5-10 percent[3,4]. The study showed a higher risk of preterm labour in women aged 20 years or less (5.2%) as compared to women in the age group 20-34 years (4.03 percent) or 35 years and above (4.10%). Other authors have also reported that young maternal age is associated with an increased rate of preterm delivery[1,5]. Hoffman & Leiv also report that there was no increase in preterm birth if parity was one or greater for mothers whose age was 30 or above.

Women coming to hospital from towns showed a lower incidence of preterm births. Illiterate women and women working as labourers had a high risk of premature labour which would point to low socio-economic status as contributing factor. Fredrick et al have also reported high incidence of preterm delivery in low social class[5]. Low risk for premature labour was found in housewives or women in regular service. Others have reported a higher risk for preterm birth associated with clerical or sales, service and manufacturing jobs and lowest risks were found for housewives and women engaged in agriculture & fishing[1]

The rate of premature labour in primigravida was 4.35 per 100 deliveries. Excluding primigravida, the rate of prematurity increased with increase in parity. Hoffman et al[1] have reported lowest incidence in para 2 births[3].

Women with short interpregnancy interval ($<$12 months) were found to be at a higher risk of going into premature labour. Fredrick et al have reported a high rate of neonatal deaths when the interpregnancy interval was very short ($<$6 months) and attributed this largely to the causes associated with prematurity and growth retardation[6]. The risk of prematurity was also higher when the outcome of last pregnancy was a still birth or an abortion as compared to when the outcome was a live birth. A higher incidence of breech deliveries (6.6%) was seen in premature deliveries as compared to the total deliveries. Although the cause of breech presentation is not always known, among the known factors responsible for breech presentation, prematurity is the commonest[3]. The perinatal mortality was higher (26%) in infants born premature as compared to total deliveries (5.78%). High perinatal and neonatal mortalities in premature infants have been reported by other authors[7,8]. Availability of specialised care for the premature infant in a number of institutions, have considerably improved the prognosis for these infants at such places, but the complex and ill understood factors that lead to initiation of labour and the difficulty in arresting the progress of premature labour continue to be unresolved problems to obstetricians. A substantial reduction in incidence of prematurity will reduce the perinatal mortality and therefore every effort should be made on all the fronts - demographic socio-economic and medical.

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TABLE 7.01: PREMATURE LABOUR-AGE OF WOMEN

Age/Status at Discharge		Premature labour No.	%	Total Deliveries No.	%
<20	Alive	147 (4.12)	74.6	3561	94.1
	S.B.	15 (12.82)	7.6	117	3.1
	Died	35 (32.40)	17.8	108	2.9
	Total	197 (5.20)	12.8	3786	10.2
20-34	Alive	967 (3.17)	74.5	30420	94.5
	S.B.	126 (10.93)	9.7	1152	3.6
	Died	205 (32.64)	15.8	628	2.0
	Total	1298 (4.03)	84.2	32200	86.8
≥35	Alive	26 (2.65)	56.5	980	87.5
	S.B.	14 (12.84)	30.4	109	9.7
	Died	6 (19.35)	13.0	31	2.8
	Total	46 (4.10)	3.0	1120	3.0
	N.K.	1		14	
	Total	1542 (4.15)		37120	

Figures in parentheses indicate rate percent of premature labour in respective groups.

Underlined figures give percentage distribution of cases of premature labour and total deliveries according to main variable (e.g. Age).

TABLE 7.02: PREMATURE LABOUR - RESIDENCE

Residence/Status at Discharge		Premature labour No.	Premature labour %	Total Deliveries No.	Total Deliveries %
City	Alive	792 (3.5)	76.1	22427	95.2
	S.B.	91 (13.4)	8.8	679	2.9
	Died	157 (34.81)	15.1	451	1.9
	Total	1040 (4.41)	67.7	23557	63.6
City Slum	Alive	131 (2.84)	67.9	4606	93.5
	S.B.	22 (11.00)	11.4	200	4.1
	Died	40 (33.6)	20.7	119	2.4
	Total	193 (3.91)	12.6	4925	13.3
Town	Alive	37 (0.98)	78.7	3760	95.6
	S.B.	3 (2.30)	6.4	130	3.3
	Died	7 (15.9)	14.9	44	1.1
	Total	47 (1.19)	3.0	3934	10.6
Village	Alive	178 (4.33)	69.3	4107	88.9
	S.B.	37 (10.22)	14.4	362	7.8
	Died	42 (27.63)	16.3	152	3.3
	Total	257 (5.56)	16.7	4621	12.5
	N.K.	5		83	
	Total	1542		37120	

TABLE 7.03: PREMATURE LABOUR - EDUCATION

Education wife/ Status at discharge		Premature labour No.	Premature labour %	Total Deliveries No.	Total Deliveries %
None	Alive	399 (4.93)	71.3	8090	91.0
	S.B.	68 (12.50)	12.1	544	6.1
	Died	93 (36.47)	16.6	255	2.9
	Total	560 (7.00)	36.3	8889	23.9
Primary	Alive	301 (2.98)	71.0	10084	94.1
	S.B.	46 (11.85)	10.8	388	3.6
	Died	77 (31.55)	18.2	244	2.3
	Total	424 (3.95)	27.5	10716	28.9
Higher Secondary	Alive	335 (2.62)	79.4	12764	95.8
	S.B.	31 (8.90)	7.3	348	2.6
	Died	56 (26.66)	13.3	210	1.6
	Total	422 (3.16)	27.4	13322	35.9
College or Above	Alive	106 (2.62)	77.9	4035	96.2
	S.B.	10 (10.00)	7.4	100	2.4
	Died	20 (34.48)	14.7	58	1.4
	Total	136 (3.24)	8.8	4193	11.3
	Total	1542		37120	

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TABLE 7.04: PREMATURE LABOUR - OCCUPATION

Occupation wife/ Status at discharge		Premature labour No.	Premature labour %	Total Deliveries No.	Total Deliveries %
Service	Alive	51 (2.87)	76.1	1774	95.7
	S.B.	6 (10.90)	9.0	55	3.0
	Died	10 (40.00)	14.9	25	1.3
	Total	67 (3.61)	4.3	1854	5.0
Labourer	Alive	37 (5.03)	68.5	735	92.2
	S.B.	11 (22.91)	20.3	48	6.0
	Died	6 (42.85)	11.1	14	1.8
	Total	54 (6.77)	3.5	797	2.1
Self-Employed	Alive	1 (1.21)	33.3	82	93.2
	S.B.	2 (33.3)	66.7	6	6.8
	Died	-	-	-	
	Total	3 (3.41)	0.2	88	0.2
Housewife	Alive	1052 (3.24)	74.2	32382	94.2
	S.B.	136 (10.70)	9.6	1271	3.7
	Died	230 (31.59)	16.2	728	2.1
	Total	1418 (4.12)	92.0	34381	92.7
	Total	1542		37120	

TABLE 7.05: PREMATURE LABOUR - RELIGION

Religion	Status at Discharge	Premature labour No. (%)	%	Total Deliveries No.	%
Hindu	Alive	1054 (3.36)	74.3	31360	94.3
	S.B.	134 (11.21)	9.4	1195	3.6
	Died	231 (33.57)	16.3	688	2.1
	Total	1419 (4.27)	92.0	33243	89.6
Muslim	Alive	53 (2.31)	65.4	2286	92.7
	S.B.	17 (12.97)	21.0	131	5.3
	Died	11 (22.0)	13.6	50	2.0
	Total	81 (3.28)	5.2	2467	6.6
Others	Alive	33 (2.48)	80.5	1327	94.1
	S.B.	4 (7.40)	9.8	54	3.8
	Died	4 (13.79)	9.8	29	2.1
	Total	41 (2.90)	2.7	1410	3.8
	N.K.	1		-	
	Total	1542		37120	

TABLE 7.06: PREMATURE LABOUR-TOTAL NO.OF PREGNANCIES

Total No. of Pregnancies	Status at Discharge	Premature labour No.	%	Total Deliveries No.	%
Nil	Alive	522 (3.56)	77.2	14657	94.4
	S.B.	57 (10.81)	8.4	527	3.4
	Died	97 (28.52)	14.3	340	2.2
	Total	676 (4.35)	43.8	15524	41.8
1 _ 2	Alive	458 (2.88)	72.1	15866	94.9
	S.B.	65 (11.94)	10.2	544	3.3
	Died	112 (37.08)	17.6	302	1.8
	Total	635 (3.79)	41.2	16712	45.1
3 - 5	Alive	146 (3.50)	69.5	4164	91.6
	S.B.	30 (11.32)	14.3	265	5.8
	Died	34 (29.82)	16.2	114	2.5
	Total	210 (4.62)	13.6	4543	12.2
> 5	Alive	15 (5.24)	71.4	286	83.9
	S.B.	3 (6.81)	14.3	44	12.9
	Died	3 (27.27)	14.3	11	3.2
	Total	21 (6.15)	1.4	341	0.9
	Total	1542		37120	

TABLE 7.07: PREMATURE LABOUR-INTERVAL SINCE LAST PREG.

Interval since last pregnancy	Status at Discharge	Premature labour No.	%	Total Deliveries No.	%
N.A./N.K.	Alive	528 (3.52)	76.7	15000	94.4
	S.B.	63 (11.60)	9.2	543	3.4
	Died	97 (28.19)	14.1	344	2.2
	Total	688 (4.32)	44.6	15893	42.8
≤ 12	Alive	106 (4.54)	75.2	2337	93.1
	S.B.	11 (10.48)	7.8	105	4.2
	Died	24 (35.82)	17.0	67	2.7
	Total	141 (5.62)	9.1	2509	6.8
13-24	Alive	251 (3.52)	73.4	7116	94.3
	S.B.	28 (10.48)	8.2	267	3.5
	Died	63 (38.65)	18.4	163	2.2
	Total	342 (4.53)	22.2	7546	20.3
≥ 25	Alive	256 (2.43)	69.0	10514	94.1
	S.B.	53 (11.39)	14.3	465	4.2
	Died	62 (32.12)	16.7	193	1.7
	Total	371 (3.32)	24.1	11172	30.1
	Total	1542		37120	

TABLE 7.08: PREMATURE LABOUR-OUTCOME OF LAST PREGNANCY

Outcome of last preg.	Status at Discharge	Premature labour No.	Premature labour %	Total deliveries No.	Total deliveries %
N.A./N.K.	Alive	530 (3.54)	77.1	14982	94.4
	S.B.	60 (11.00)	8.7	545	3.4
	DIed	97 (28.44)	14.1	341	2.1
	Total	687 (4.32)	44.6	15877	42.8
Abortion	Alive	118 (4.18)	77.1	2819	93.6
	S.B.	8 (6.83)	5.2	117	3.9
	Died	27 (35.06)	17.6	77	2.7
	Total	153 (5.07)	9.9	3013	8.1
Still Birth	Alive	43 (6.58)	71.7	653	89.1
	S.B.	10 (19.23)	16.7	52	7.1
	Died	7 (25.92)	11.7	27	3.7
	Total	60 (8.19)	3.9	732	2.0
Live Birth	Alive	450 (2.72)	70.1	16510	94.3
	S.B.	77 (11.56)	12.0	666	3.8
	Died	115 (35.71)	17.9	322	1.8
	Total	642 (3.66)	41.6	17498	47.1
	Total	1542		37120	

TABLE 7.09: PREMATURE LABOUR-TOTAL NO. OF SPONT.ABORTIONS

No. of Spontaneous Abortions	Cases of premature labour No.	%	Total Deliveries No.	%
Primigravida	676 (4.35)	43.8	15524	41.8
Nil	693 (3.83)	44.9	18085	48.7
1	118 (4.74)	7.7	2488	6.7
$\geqslant 2$	55 (5.38)	3.6	1023	2.8
Total	1542 (4.15)		37120	

TABLE 7.10: PREMATURE LABOUR-TYPE OF DELIVERY

Type of Delivery	Premature Deliveries		Total Deliveries	
	No.	%	No.	%
Spontaneous vertex	1247	80.9	27751	74.8
Breech	102	6.6	834	2.2
Vacuum/Forceps	70	4.5	3166	8.5
LSCS	95	6.2	5096	13.7
Destructive	4	0.2	35	0.1
Others	24	1.6	238	0.6
Total	1542		37120	

TABLE 7.11:PREMATURE LABOUR - STATUS AT DIS HARGE

Status	Cases of premature labour No.	%	Total Deliveries No.	%
Alive	1141 (3.26)	74.0	349[illegible]3	94.2
S.B.	155 (11.23)	10.1	1[illegible]80	3.7
Died during Hospital stay	246 (32.07)	15.9	767	2.1
Total	1542 (4.15)		[illegible]7120	

BIRTH WEIGHT

Birth weight is included as one of the twelve global indicators of health. Child survival and future physical growth and development of babies depends a great deal on birth weight. The average birth weight of babies in this study was found to be 2.7±0.5 kg. from this study. Rate of low birth weight (<2500 gms.) was 26.0 percent of which 14.6 percent had birth weight below 2250 gms. In 6.8 percent of babies the birth weight was below 2000 gms. The birth weight was studied in detail in relation to demographic and obstetric parameters.

OBSERVATIONS

Age of mother

It was observed that younger mothers (<20 years of age) gave birth to babies with an average weight of 2.56±0.46 kg. which was significantly less than the average weight of babies 2.68±0.48 delivered by the older mothers. Of the babies born to the mothers of age less than 20 years 33.4 percent weighed less than 2500 gms. as compared to 25 percent among mothers of 20-34 years and 29.6 percent of babies of older mothers of age 35 years or more. These differences were significant ($P<0.05$). About 19 percent babies had birth weight less than 2250 gms. in women less than 20 years or more than 34 years of age (Table 8.01). Percentage of babies below birth weight of 2000 gms. was 8.4 and 9.7 for mothers below 20 and above 34 years respectively compared to 6.5 percent for mothers of 20-34 years of age.

Education

Average birth weight of the babies increased steadily from 2.57 kg. for mothers with no education to 2.65, 2.72 and 2.82 kg. for mothers with education from primary to college level. Rate of low birth weight thus decreased from 33.5 percent to 27.9, 22.4 and 16.2 percent with increase in education. This trend was found to be significant ($p<0.001$). Similar trend was also observed in relation to education of father (Table 8.02& 8.03).

Residence

Rate of low birth weight was found to be lowest (18.6%) among the babies born to mothers coming from near by towns in comparison to babies born to mothers from city, city slums or nearby villages (26.2% to 28.2%). Average birth weight of town babies was 2.78 kg. which was significantly higher than the average birth weight of babies from cities or villages (2.66 to 2.68 kg.) ($P<0.01$). No difference was found in average birth weight of babies from village or cities (Table 8.04). This is also because there were more babies with birth weight below 2250 gms. (18.3% in villages compared to 14.3% in cities) and above 3499 gms. (8.0% in villages and 4.3% in cities).

Working Status

Majority of women (92.6%) were housewives and rate of low birth weight babies among them was 26.2 as compared to 26.0 percent for the total. In fact women who were working and had a regular service had the lowest rate (18.3%) of low birth weight babies ($P<.001$). Among the working women labourers showed the highest rate (33.6%) of low birth weight babies. Average birth weight of babies among labour class women was 2.6 kg., which was about 100 gms. less than overall average birth weight (Table 8.05).

Religion

In this study Hindu women seemed to have delivered babies with lowest average birth weight (2.67 kg.). The rate of low birth weight babies was also highest among Hindus (26.4%) as compared to Muslims (24.0%), Christians (18.2%) or Sikhs (21.8%) ($P<0.05$). The average birth weight of babies among Christians (2.82 kg.) and Sikhs (2.78 kg.) was significantly higher than Hindu (2.67 kg.) or Muslim (2.71 kg.) babies (Table 8.06).

Type of family

Among the mothers who came from nuclear families low birth weight rate was 25.0 percent which was significantly less than low birth weight rate of 26.7 percent for mothers from joint families ($P<.05$). Average birth weight of babies from nuclear families was 2.70 kg. as compared to 2.67 kg. for babies born in joint families (Table 8.07).

No. of previous pregnancies

Babies of birth order 2nd and 3rd seemed to be doing better in terms of birth weight. The average birth weight in this category was 2.72 kg. compared to 2.63 kg. and 2.65 kg. for birth order one and 6 or above respectively. These differences in average birth weight were statistically significant. Ignoring the primigravida women, the rate of low birth weight increased with increase in parity (Table 8.08).

History of spontaneous abortions

Rate of low birth weight babies in women with history of spontaneous abortion (25.4%) was no different from others (26.0%). However the percentage of babies weighing less than 2250 gms. born to women with history of spontaneous abortion (15.8%) was significantly higher ($P<.05$) (Table 8.09).

Outcome of last pregnancy

Spontaneous abortion as outcome of last pregnancy or any other pregnancy as discussed earlier, did not seem to contribute to low birth weight when 2500 gms. is taken as the cut-off point. The average birth weight of babies born to mothers who had a still birth during last pregnancy was 2.61 kg. as compared to 2.71 kg. and 2.72 kg. for babies born to women in whom outcome of last pregnancy was abortion or live birth respectively. These differences were statistically significant ($P<0.01$) (Table 8.10).

Interval since last pregnancy termination

Women who conceived within one year of last pregnancy, gave birth to babies with an average birth weight of 2.66 kg as compaed to average birth weight of 2.70 and 2.72 kg. in babies born to women who conceived during one to two years or after 2 years of last pregnancy. Thus longer inter pregnancy interval helps improve birth weight of babies ($p<.05$). Rate of low birth weight decreased from 27.5 percent to 22.7 percent with increase in inter pregnancy interval from less than 12 months to more than 2 years (Table 8.11).

Outcome of pregnancy

Outcome of pregnancy was still birth in 3.7 percent of the deliveries. Among the still births 71.0 percent were low birth weight babies, 63.7 percent of which weighed less than 2250 gms. Still birth rate among the low birth weight babies was 10.1 percent. Looking at the babies in finer birth weight categories, it was observed that the still birth rate was 24.1 among babies weighing below 2000 gms., 8.6 percent among babies weighing 2000-2249 gms. and this rate further decreased to 2.1 and 1.3 for babies weighing 2250-2499 gms. and 2500-3499 gms. (Table 8.12). This suggests, that the cut off point for low birth weight can be brought down to 2250 gms..

COMPLICATIONS DURING PREGNANCY

Though 68.2 percent women in this study came to hospital for delivery, the rest were admitted because of some pregnancy related complication. Major reasons for low birth weight were premature onset of labour and antepartum haemorrhage with 86.7 and 54.7 percent babies weighing less than 2500 gms. respectively in these groups. These two reasons accounted for 26.6 percent of babies with low birth weight. In cases with hepatitis, anaemia, and hypertensive disorders of pregnancy, the incidence of low birth weight was 45.3, 38.3 and 33.8 percent respectively. Low birth weight was associated with malpresentation in 31.2 percent and heart disease in 29.6 percent (Table 8.13). The rate of low birth weight was 19.9 percent in uncomplicated pregnancies. All complications combined accounted for 47.3 percent of low birth weight babies. Of the babies weighing less than 2250 gms. in 60.8 percent mother had some complication.

Sex of Baby

Average birth weight of female babies was 2.65 kg. as compasred to 2.72 kg. for male babies ($p < .001$). Percentage of low birth weight was 23.3 and 27.5 for male and female babies respectively (Table 8.14). Average birth weight in twins as expected was as low as 1.96 kg. with 68.8 percent weighing below 2250 gms. The weight of the 1st twin was accounted here.

STATUS AT DISCHARGE

Of the 35740 live births 767 (2.1%) babies died during hospital stay. Among the babies who died 80.1 percent were low birth weight of which 75.2 percent weighed below 2250 gms. Mortality rate among babies during hospital stay was 12.4 percent for babies with birth weight less than 2250 gms. which reduced to 0.9 percent for babies weighing 2250-2499 gms. and to 0.6 percent for normal birth weight babies (Table 8.15). Early neonatal mortality during hospital stay also suggests that the cut off point for low birth weight could be brought down to 2250 gms. for our population. Risk of mortality reduced considerably with increase in birth weight to 2250 gms. or more.

DISCUSSION

Low birth weight is the most important factor associated with perinatal mortality. Besides, the dangers of short and long term mental and physical handicap increase with the extent of low birth weight. This study has shown an incidence of low birth weight of 26.0 percent in urban teaching hospitals. Other Indian studies report an incidence between 20-40 percent . The average birth weight varies with different geographical areas. For example, in Indians, Burmese, Bambuti pygmies etc. the average birth weight is reported to be 2.7 kg.. Among Chinese, Japanese, Thai, etc. the average birth weight lies between 2.9-3.2 kg. and in Great Britain, Norway, Sweden, etc. the average birth weight is about 3.4 kg.. One of the causes of this variation of birth weight is probably genetic[3]. About 40 percent of birth weight variation has been attributed to genetic factor, half of which are due to foetal autosomal genes and sex and the other half from the mother. About 60 percent of the variation is due to maternal health and nutrition in general and the effect of the intrauterine environment of the foetus[4]. Women coming from poor socio-economic class are at a higher risk of delivering babies with low birth weight[5,6]. In this study also labourers had a high proportion of low birth weight babies (33.6%) as compared to women in regular services (18.3%) or housewives (26.2%). Also low birth weight was higher among the illiterate. In fact, the study showed a higher incidence of low birth weight when both parents were illiterate as compared to parents with even primary school education and the incidence decreased with increase in education. Rosenwaike has also reported that the proportion of low birth weight babies varied inversely with maternal education level[7].

Low birth weight babies were significantly more among the Hindu women, as compared to women of other religion. Women coming from joint families also had a higher proportion of low birth weight babies.

Women below 20 years of age and 35 years or older are at high risk of delivering low birth weight babies. Primigravida also showed a higher rate (28.8%) as compared to multipara (23.2 percent for parity range 1-2, and 26.0 percent parity range 3-5). If primigravida were excluded the incidence of low birth weight increased with increase in parity. Majority of young mothers came from low socio-economic class. The risk of low birth weight babies in older women also does not seem to be related to age alone and a history of reproductive problems may account for some of the pregnancy risks seen in older women[8]

With regard to association of previous obstetric history with low birth weight, previous spontaneous abortion did not show any adverse relationship with birth weight if the cut off point for LBW was 2500 gms. but it did show an increased risk of LBW if the cut off point is 2250 gms.. Previous history of spontaneous abvortion also resulted in higher incidence of premature labour and APH, these being the important known causes of LBW. However, the risk of delivering low birth weight babies in current pregnancy was significantly higher when the outcome of last pregnancy was a still birth (31.7%) as compared to when the outcome was a live birth (23.5%). Billcwiez et al also showed an association of previous still birth with birth weight and reported that women whose first pregnancy ended in still birth tended to have second babies about 250 gms. lighter on average than second babies born to women who had no still birth[9].

The risk of low birth weight was more when the interval since last pregnancy termination was less than 12 months. Fredrick J. et al attribute the high incidence of neonatal deaths with very short interpregnancy intervals (<6 months) to causes associated with short gestation and growth retardation[10].

Still birth rate among low birth weight babies was 10.1 percent. If we further break up the low birth weight categories, still birth rate was 24.1 percent among babies <2000 gms., 8.6 percent in babies 2000-2249 gms., 2.01 percent among babies weighing between 2250-2499 gms.. The still birth rate in normal weight babies (2500-3499 gms.) was 1.3 percent. This shows

a sharp rise in still birth rates in babies weighing 2250 gms. as compared to those weighing between 2250-2499 gms. Early neonatal deaths also reduced considerably with increase in birth weight to 2250 gms. or more. Early neonatal death rate was 12.4 percent for babies with birth weight <2250 gms., 0.9 percent for babies weighing 2250-2499 gms. and 0.6 percent for normal weight babies. Bajpai et al and Walia et al also report substantial fall in mortality in 2000-2500 gms. group[11,12]. This raises the question of the appropriateness of an arbitiary value of 2500 gms. as the cut off point for low birth weight. Walia et al do not recommend lowering of limit for LBW to 2000 gms. as the incidence of respiratory distress syndrome was still significant in 2001-2500 gms. group[11]. Although it was beyond the scope of this study to examine the relation of respiratory distress syndrome and birth weight, it was observed that there was a sharp difference in both outcome of delivery and in mortality between the 2250 gms. birth weight group and 2250-2499 gms. group. More extensive research on the reproductive outcomes in smaller intervals of birth weights as well as follow up of these babies for subsequent morbidity and mortality will be required to resolve this issue.

As expected, maternal complications at admission particularly premature labour, APH, hepatitis, anaemia HDP etc. were associated with higher incidence of LBW as compared to women who had no complication at admission. Here again in HDP and APH cases, the percentage of babies falling in <2250 gms. groups was significantly higher but similar to the normal cases in the 2250-2499 gms. group emphasising the importance of studying the cut off points from categorising babies as low birth weight.

The average weight of female babies (2.65 kg.) was significantly less than average weight of male babies (2.72 kg.) giving correspondingly high rates of low birth weight female babies (27.5%) than male babies (23.3%). The study has shown some of the factors associated with low birth weight, but the mechanism by which these factors act in causing reduction in foetal growth is not known. This accounts for the fact that while good standards of antenatal care might help in abnormal cases, the role of obstetric management per se in accelerating foetal growth in normal cases is not understood.

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TABLE 8.01: BIRTH WEIGHT - AGE OF MOTHER

Age(Yrs)	<2250 No.	Rate%	2250-2499 No.	Rate%	2500-3499 No.	Rate%	≥3500 No.	Rate%	N.K.	Total	Mean±S.D. Weight(Kg.)
<20	721	19.2	535	14.2	2402	63.9	103	2.7	25	3786 (10.2)	2.56±0.46
20-34	4438	13.9	3543	11.1	22233	69.5	1780	5.5	206	32200 (86.7)	2.70±0.49
≥35	211	19.0	118	10.6	699	63.1	80	7.2	12	1120 (3.0)	2.68±0.59
N.K.	3	-	-	-	9	-	1	-	1	14	
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

Figures in parentheses indicate column percentages

TABLE 8.02: BIRTH WEIGHT - EDUCATION OF MOTHER

Education	<2250		2250-2499		2500-3499		≥3500		N.K.	Total	Mean±S.D. Weight(Kg.)
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%			
Nil	1805	20.5	1148	13.0	5525	62.7	330	3.7	81	8889 (23.9)	2.57±0.51
Primary	1664	15.6	1309	12.3	7154	67.2	517	4.9	72	10716 (28.9)	2.65±0.50
Higher Secondary	1566	11.8	1400	10.6	9504	71.7	790	6.0	62	13322 (35.9)	2.72±0.47
College or Above	338	8.1	339	8.1	3160	75.9	327	7.9	29	4193 (11.3)	2.82±0.47
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.03: BIRTH WEIGHT - EDUCATION OF FATHER

Education	< 2250		2250-2499		2500-3499		≥ 3500		N.K.	Total	Mean±S.D. Weight(Kg.)
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%			
Nil	758	22.3	422	12.4	2075	61.1	142	4.2	41	3438 (9.7)	2.56±0.54
Primary	1488	19.0	1009	12.9	4956	63.2	389	5.0	46	7888 (21.3)	2.61±0.52
Higher Secondary	2311	14.3	1914	11.8	11112	68.6	865	5.3	100	16302 (43.9)	2.68±0.49
College or Above	816	8.6	851	9.0	7200	76.3	568	6.0	57	9492 (25.6)	2.77±0.45
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.04: BIRTH WEIGHT - RESIDENCE

Residence	<2250 No.	<2250 Rate%	2250-2499 No.	2250-2499 Rate%	2500-3499 No.	2500-3499 Rate%	≥3500 No.	≥3500 Rate%	N.K.	Total	Mean±S.D. Weight(Kg.)
City	3356	14.3	2902	12.4	16181	69.0	1020	4.3	98	23557 (63.3)	2.66±0.61
Slum	785	16.1	490	10.1	3298	67.9	284	5.9	68	4925 (13.3)	2.67±0.51
Town	378	9.7	349	8.9	2898	74.0	291	7.5	18	3934 (10.6)	2.78±0.47
Village	835	18.3	450	9.9	2909	63.8	368	8.0	59	4621 (12.5)	2.68±0.57
N.K.	19		5		57		1		1	83	
Total	5773	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.05: BIRTH WEIGHT-WORKING STATUS OF MOTHER

Working Status	< 2250 No.	Rate%	2250-2499 No.	Rate%	2500-3499 No.	Rate%	⩾ 3500 No.	Rate%	N.K.	Total	Mean±S.D. Weight(Kg.)
Service	180	9.8	156	8.5	1383	75.0	125	6.8	10	1854 (5.0)	2.80±0.49
Self-employed	14	16.1	10	11.5	57	65.5	6	6.9	1	88 (0.2)	2.71±0.44
Labourer	154	19.4	113	14.2	485	61.2	40	5.1	5	797 (2.1)	2.60±0.53
Housewife	5025	14.7	3917	11.5	23418	68.6	1793	5.2	228	34381 (92.6)	2.67±0.49
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.06: BIRTH WEIGHT - RELIGION

Religion	<2250		2250-2499		2500-3499		≥3500		N.K.	Total	Mean±S.D. Weight(Kg.)
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%			
Hindu	4857	14.8	3845	11.6	22638	68.6	1678	5.1	225	33243 (89.6)	2.67±0.49
Muslim	349	14.3	239	9.7	1711	69.6	159	6.5	9	2467 (6.6)	2.71±0.51
Christian	109	11.5	64	6.7	680	71.7	96	10.1	6	955 (2.6)	2.82±0.54
Sikh	31	11.1	30	10.8	203	72.7	15	5.4	4	283 (0.8)	2.78±0.49
Others	27	15.7	18	10.5	111	64.5	16	9.3	-	172 (0.5)	2.72±0.54
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.07: BIRTH WEIGHT - TYPE OF FAMILY

Type of Family	<2250 No.	<2250 Rate%	2250–2499 No.	2250–2499 Rate%	2500-3499 No.	2500-3499 Rate%	≥3500 No.	≥3500 Rate%	N.K.	Total	Mean±S.D. Weight(Kg.)
Nuclear	2416	14.0	1896	11.0	11888	69.0	1034	6.0	116	17350 (47.1)	2.70±0.50
Joint	2909	15.0	2261	11.7	13281	68.6	913	4.8	127	19491 (52.9)	2.67±0.48
N.K.	48		39		174		17		1	279	
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.08: BIRTH WEIGHT-NO. OF PREVIOUS PREGNANCIES

No.of Prev. Pregnancies	< 2250 No.	Rate%	2250-2499 No.	Rate%	2500-3499 No.	Rate%	≥3500 No.	Rate%	N.K.	Total	Mean±S.D. Weight(Kg.)
0	2507	16.3	1935	12.5	10420	67.6	563	3.6	99	15524 (41.8)	2.63±0.48
1-2	2087	12.6	1765	10.6	11724	70.6	1038	6.2	98	16712 (45.0)	2.72±0.49
3-5	707	15.7	463	10.3	2991	66.5	340	7.6	42	4543 (13.2)	2.70±0.56
>5	72	21.4	33	9.8	208	61.9	23	6.8	5	341 (0.9)	2.65±0.59
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.09:BIRTH WEIGHT-HISTORY OF SPONTANEOUS ABORTIONS

History of Abortion	< 2250		2250-2499		2500-3499		≥ 3500		N.K.	Total	Mean±S.D. Weight(Kg)
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%			
No	4824	14.4	3861	11.6	22994	68.8	1720	5.1	211	33610 (90.6)	2.68±0.49
Yes	549	15.8	335	9.6	2349	67.6	244	7.0	33	3510 (9.4)	2.69±0.51
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.10: BIRTH WEIGHT - OUTCOME OF LAST PREGNANCY

Outcome	≤2250		2250-2499		2500-3499		≥3500		N.K.	Total	Mean±S.D. Weight(Kg.)
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%			
Abortion	435	14.6	277	9.3	2044	68.4	230	7.7	27	3013 (14.2)	2.71±0.5
Still Birth	151	20.9	78	10.8	449	62.3	43	6.0	11	732 (3.4)	2.61±0.61
Live Birth	2229	12.8	1864	10.7	12187	70.1	1115	6.4	103	17498 (82.4)	2.72±0.59
N.A/N.K.	2558	16.2	1977	12.5	10663	67.6	576	3.7	103	15877	2.63±0.47
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.70±0.50

TABLE 8.11:BIRTH WEIGHT-INTERVAL FROM LAST PREGNANCY TERMINATION TO CONCEPTION

Interval (Months)	< 2250 No.	Rate%	2250-2499 No.	Rate%	2500-3499 No.	Rate%	≥ 3500 No.	Rate%	N.K.	Total	Mean±S.D. Weight(Kg.)
< 12	414	16.6	271	10.9	1643	66.0	162	6.5	19	2509 (11.8)	2.66±0.55
13-24	1019	13.6	794	10.6	5266	70.1	429	5.7	38	7546 (35.5)	2.70±0.51
> 24	1377	12.4	1144	10.3	7769	70.1	794	7.2	88	11172 (52.6)	2.72±0.51
N.A/N.K.	2563	16.2	1987	12.6	10665	67.5	579	3.7	99	15893	2.63±0.48
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.12: BIRTH WEIGHT - OUTCOME OF PREGNANCY

Outcome	<2250		2250-2499		2500-3499		≥3500		N.K.	Total
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%		
Live Birth	4587	12.9	4106	11.5	25014	70.2	1935	5.4	98	35740
Still Birth	786	63.7	90	7.3	329	26.6	29	2.4	146	1380
	(14.6)		(2.1)		(1.3)		(1.5)			(3.7)
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120

Figures in parentheses are percentage of still birth as of total births

TABLE 8.13:BIRTH WEIGHT - MAJOR COMPLICATIONS DURING PREGNANCY

Complication	<2250		2250-2499		2500-3499		≥3500		N.K.	Total
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	No.
HDP(BP≥130/90mm.Hg.)	828	22.7	405	11.1	2205	60.3	217	5.9	52	3707
Premature Labour	1169	77.0	147	9.7	189	12.4	14	0.9	23	1542
APH	300	44.1	72	10.6	293	43.0	16	2.3	17	698
Anaemia (Hb<8gm%)	407	26.6	180	11.7	864	56.4	81	5.3	11	1543
Malpresentation	246	20.6	127	10.6	766	64.0	57	4.8	31	1227
Hepatitis	33	39.3	5	6.0	45	53.6	1	1.2	1	85
Heart Disease	43	14.3	46	15.3	193	64.3	18	6.0	6	306
Diabetes	8	8.5	9	9.6	55	58.5	22	23.4	3	97
No Complications	2106	8.3	2942	11.6	18908	74.7	1308	5.4	61	25325
Total Deliveries	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120

Cases with other complications are not included in this Table

TABLE 8.14: BIRTH WEIGHT - SEX OF BABY

Sex of Baby	<2250 No.	<2250 Rate%	2250-2499 No.	2250-2499 Rate%	2500-3499 No.	2500-3499 Rate%	≥3500 No.	≥3500 Rate%	N.K.	Total	Mean±S.D. Weight(Kg.)
Male	2403	12.8	1974	10.5	13251	70.3	1209	6.4	110	18947	2.72±0.49
Female	2654	15.2	2141	12.3	11867	68.2	743	4.3	81	17486	2.65±0.48
Ambiguous	6	37.5	1	6.3	7	43.8	2	12.5	9	25	2.41±0.91
Twins	263	68.8	44	11.5	73	19.1	2	0.5	15	397	1.96±0.57
Not Recorded	47		36		145		8		29	265	
Total	5373	14.6	4196	11.4	25343	68.7	1964	5.3	244	37120	2.68±0.48

TABLE 8.15: BIRTH WEIGHT - STATUS AT DISCHARGE

Status	<2250		2250-2499		2500-3499		≥3500		N.K.	Total
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%		
Alive	4016	11.5	4069	11.7	24873	71.3	1925	5.5	90	34973
Died	571 (12.4)	75.2	37 (0.9)	4.9	141 (0.6)	18.6	10 (0.5)	1.3	8	767 (2.1)
Total Live births	4587	12.9	4106	11.5	25014	70.2	1935	5.4	98	35740

Figures in parentheses are percentage died as of total live births

OPERATIVE DELIVERIES

The rising rate of caesarean section is causing concern and needs critical appraisal. It is necessary to assess the extent to which caesarean section really improves the perinatal outcome. At the same time it is important to note that the maternal mortality is higher in caesarean section cases. The approach to high risk pregnancy, the relative safety of operative procedure and anaesthesia and the experience and attitude of the obstetricians play an important role in obstetric decision making. The demographic and obstetric factors associated with operative deliveries are studied in 37120 deliveries which took place in the participating hospitals.

OBSERVATIONS

Of the total, 85.6 percent women had vaginal delivery. This included 74.8 percent spontaneous vaginal deliveries, 2.2 percent breech deliveries, 1.6 percent vacuum extractions and 6.9 percent forceps deliveries. Caesarean section had to be performed in 13.7 percent of the cases, of which only 0.4 percent were for failed trial of vacuum or forceps. For 35 women (0.1%) destructive operation had to be performed. In 238 women (0.6%) more than one procedure of delivery was adopted mostly for cases with twin pregnancies (Table 9.01).

Indications for Operative Delivery

The commonest indication for vacuum/forceps delivery was prolonged labour (41.7%). Foetal distress was the indication for 17.2 percent of vacuum/forceps cases. Prophylactic application of forceps was the indication in another 32.1 percent of these cases. Other indications included maternal exhaustion, after coming head of breech and non rotation (Table 9.02).

Regarding indications for caesarean section (including caesarean hysterectomies) foetal distress was the commonest indication comprising 21.7 percent of all caesarean sections. Previous caesarean section was the cause in 18.4 percent and cephalopelvic disproportion in 11.8 percent caesarean section. APH was the indication in 5.6 percent and malpresentation in 9.2 percent. Other causes for caesarean section included failed inductions,

caesarean section following failed vacuum/forceps application, and elective caesarean section. CS was done for tumours/malignancies in 0.2 percent. Caesarean hysterectomy was done in 0.7 percent of caesarean section(for rupture uterus) (Table 9.03).

Destructive operation were performed on 35 babies. Hydrocephalus was the most frequent cause for destructive operations (17 babies). Other causes were impacted transverse lie (7), impacted shoulder (4), distension of foetal abdomen (4) and one case each due to impacted occipito posterior, after coming head of breech and monster respectively. An attempt was made to study the association if any, between the type of delivery and other factors.

Age

Chances of having a normal vaginal delivery decreased significantly from 79.1 percent in women below 20 years of age to 66.3 percent for women of age 35 years or above ($P<.01$). Rate of vacuum/forceps deliveries decreased significantly from 10.3 percent to 5.9 percent whereas rate of caesarean sections increased significantly from 8.0 percent for women aged below 20 years to 23.8 for women 35 years or above respectively (Table 9.04).

Number of previous pregnancies

The rate of caesarean section deliveries was seen to be significantly higher ($P<.05$) among grand multiparous women (parity >5) (17.9%) as compared to primiparous (13.9%) or women with parity 1 to 5. On the other hand vacuum or forceps deliveries were highest (13.6%) among primiparous ($P<.001$). Thus women with parity 1-5 seemed to have significantly higher chances of having normal vaginal delivery compared to primiparous or multiparous women ($P<.05$) (Table 9.05).

History of spontaneous abortions

History of spontaneous abortion showed significant effect on nature of delivery. Rate of caesarean sections (18.5%) and forceps deliveries (10.0%) were significantly higher ($P<.05$) for women who gave history of spontaneous abortion as compared to women who had no previous spontaneous abortion (13.2% C.S. and 8.3% forceps deliveries) (Table 9.06).

History of previous operative delivery

As expected, the rate of caesarean section was very high (62.4%) for women who had history of caesarean section. It was 60.3% for one previous CS and 92.0% for repeated CS It is worth noting that 23.2 percent of women with one previous caesarean section had spontaneous vaginal delivery and of remaining 12.8 percent delivered with the help of vacuum or forceps. Of the women who had two or more previous caesarean sections 8 percent (12 women) had spontaneous vaginal delivery. Of the women who had vacuum/forcep delivery previously, 70.8 percent delivered spontaneously this time (Table 9.07).

Outcome of last pregnancy

Adverse outcome of last pregnancy, abortion or still birth decreases the chances of normal delivery to 71.4 & 63.7 percent as compared to 80.8 percent for women in whom outcome of last pregnancy was a live birth. Rates of caesarean sections in this pregnancy were 17.9 percent and 23.6 percent respectively for women in whom last pregnancy had terminated in abortion or still birth as compared to 12 to 14 percent for others. These differences were statistically significant ($P<.01$) (Table 9.08).

Inter pregnancy interval

Rate of caesarean sections or vacuum/forceps deliveries in women who had conceived within one year of last pregnancy was 15.4 and 5.3 percent respectively. These were significantly more than respective rates for women in whom this interval was more than one year (13.2 and 4.3% respectively) ($P<.05$) (Table 9.09).

Outcome of Delivery

Of the total still births 13 percent were delivered by caesarean section. Looking at it from the other angle there were 3.53 percent women who had delivered dead born even after caesarean section as compared to still birth rate of 3.72 percent for total deliveries. In addition, 2.83 percent babies born by caesarean section had died before leaving hospital. Excluding the breech deliveries maximum perinatal deaths occurred in caesarean section cases (Table 9.10).

Maternal deaths

In this study the maternal death rate was observed to be 2.65 per 1000 deliveries (excluding deliveries from one centre). More than 35 percent of total maternal deaths had occurred in women who either had caesarean section or vacuum/forceps delivery. This gave a maternal death rate of 8.11 and 4.22 per 1000 deliveries for caesarean sections and vacuum/forceps as compared to 1.52 for spontaneous vaginal deliveries. In three women who had caesarean section, the cause of death was pulmonary embolism. The indication for LSCS in these women were, CPD (2) non-progress of labour (1). In the remaining maternal deaths after caesarean sections, there was some medical or obstetric condition which may also have contributed to the risk of mortality.

DISCUSSION

Over the past decade there has been a gradual increase in the rate of caesarean section even in the developing countries causing considerable professional concern. The national and international caesarean section rates vary widely from about 8 to 18 percent. Even in rural obstetric practice it has risen from 3.8 percent in 1965-68 to 17.8 percent in 1984-86[1,2,3,4]. In this study the rate of caesarean section was 13.7 percent and 6.9 percent women delivered by forceps/vacuum.

The commonest indication for forceps/vacuum was prolonged labour (42.0%). Foetal distress (21.7%) was also the commonest indication for LSCS. As most of these institutions have judged 'foetal distress' only by clinical parameters, it seems foetal distress is perhaps overdiagnosed. Previous CS was the indication in 18.4 percent of the cases and 11.8 percent caesarean sections were done for CPD. A study by Pandey et al on ten year profile of caesarean deliveries also reports that 17.2 percent of caesarean sections were performed for previous CS and 15.2 percent for CPD but in only 9.8 percent of caesarean sections the indication was foetal distress[2]. Some Latin American hospitals report a higher incidence of elective caesarean section[5]

As the age of the woman increased, her chances of having a vaginal delivery decreased. The rate of caesarean sections increased significantly from 8.0 to 23.8 percent for women aged below 20 years and above 34 years. Similar results are reported by Janowitz et al[5]. On the other hand, there was a decrease in the rate of vacuum/forceps deliveries from 10.2 percent to 5.9 percent in these age groups.

The rate of forceps/vacuum deliveries was highest in primigravida while caesarean section rate was highest in grand multiparous women.

Women who had a previous caesarean delivery had very high rate of caesarean in current pregnancy. It was 60.3 percent for women with one previous caesarean and 92.0 percent for repeated caesarean section, 23.2 percent of women with one previous caesarean section and 8 percent of women with 2 or more previous caesarean sections had spontaneous vaginal delivery The decision to allow a trial labour in cases with previous caesarean sections, (particularly after 2 previous caesarean sections) depends on indication for previous caesarean sections, and other associated high risk factors. Women with more than one previous caesarean section are generally recommended elective caesarean section. Some studies have shown 70-77 percent successful vaginal deliveries after trial labour following more than one previous caesarean section if there was no other contraindication to vaginal delivery[6,7].

Rates of operative deliveries were higher in women who had history of spontaneous abortion or had conceived within a year of last pregnancy termination. If we exclude perinatal mortality in breech deliveries, maximum perinatal mortality occurred in caesarean deliveries. The maternal mortality also increased with operative deliveries (8.11 & 4.22 per 1000 deliveries for caesarean section and forceps/vacuum deliveries respectively) as compared to the overall maternal mortality (2.65 per 1000 deliveries). The increased perinatal mortality and maternal mortality may be also due to the associated obstetric conditions. Taking this into consideration the contribution of caesarean section per se to maternal and perinatal morbidity and mortality needs to be studied in greater detail.

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TABLE 9.01: TYPE OF DELIVERY

Type of Delivery	No.of women	Percent
Spontaneous vaginal	27751	74.8
Breech	834	2.2
Vacuum	582	1.6
Vacuum followed by CS	7	-
Forceps	2559	6.9
Forceps followed by CS	135	0.4
Rotation and Delivery	25	0.1
Caesarean Sections	4954	13.4
Destructive Operations	35	0.1
Others	238	0.6
Total	37120	100.0

TABLE 9.02: INDICATIONS FOR VACUUM/FORCEPS DELIVERIES

Indication	No.of women	Percent
Prolonged labour	1318	41.7
Foetal distress	546	17.2
Maternal exhaustion	161	5.1
Non rotation	96	3.0
After coming head of breech	29	0.9
Prophylactic	1016	32.1
Total	3166	100.0

TABLE 9.03: INDICATIONS FOR CAESAREAN SECTION

Indication	No.of women	Percent
Foetal distress	1104	21.7
Previous Caesarean Section	937	18.4
CPD	602	11.8
Malpresentation	569	9.2
APH	283	5.6
Obstructed/Prolonged labour	493	9.7
PET/Eclampsia	119	2.3
Uterine intertia	109	2.1
Rupture Uterus	35	0.7
Tumour/Malignancy	11	0.2
Other/Elective	934	18.3
Total	5096	100.0

TABLE 9.04: TYPE OF DELIVERY - AGE

Age	Spont. Vaginal No.	Rate%	Breech No.	Rate %	Vacuum/Forceps No.	Rate%	LSCS No.	Rate%	Destructive No.	Rate%	Others No.	Rate%	Total
<20	2993	79.1	93	2.5	389	10.3	301	8.0	2	0.1	8	0.2	3786
20-34	24014	74.6	710	2.2	2710	8.4	4524	14.0	28	0.1	214	0.7	32200
≥35	742	66.3	31	2.8	66	5.9	266	23.8	5	0.4	10	0.9	1120
N.K.	2		-		1		5		-		6		14
Total	27751	74.8	834	2.2	3166	8.5	5096	13.7	35	0.1	238	0.6	37120

TABLE 9.05: TYPE OF DELIVERY-NO. OF PREVIOUS PREGNANCIES

No. of Preg.	Spont. Vaginal		Breech		Vacuum/Forceps		LSCS		Destructive		Others		
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	Total
0	10818	69.7	336	2.2	2114	13.6	2157	13.9	15	0.1	84	0.5	15524
1-2	13080	78.3	352	2.1	894	5.3	2270	13.6	13	0.1	103	0.6	16712
3-5	3607	79.4	132	2.9	145	3.2	608	13.4	6	0.1	45	1.0	4543
> 5	246	72.1	14	4.1	13	3.8	61	17.9	1	0.3	6	1.8	341
Total	27751	74.8	834	2.2	3166	8.5	5096	13.7	35	0.1	238	0.6	37120

TABLE 9.06: TYPE OF DELIVERY-HISTORY OF SPONT.ABORTION

History of Abortion	Spont.vaginal		Breech		Vacuum/Forceps		LSCS		Destructive		Others		Total
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	
No	25340	75.4	752	2.2	2815	8.4	4448	13.2	34	0.1	221	0.7	33610
Yes	2411	68.7	82	2.3	351	10.0	648	18.5	1	-	17	0.5	3510
Total	27751	74.8	834	2.2	3166	8.5	5096	13.7	35	0.1	238	0.6	37120

TABLE 9.07: TYPE OF DELIVERY-HISTORY OF PREVIOUS OPERATIVE DELIVERY

Previous Operative Delivery	Spont. vaginal		Breech		Vacuum/Forceps		LSCS		Destructive		Others		Total
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	
Nil	26821	78.4	797	2.3	2797	8.1	3555	10.4	34	0.1	223	0.7	34227
LSCS	545	23.2	25	1.1	301	12.8	1464	62.4	1	-	12	0.5	2348
Destructive	5	57.1	-	-	-	-	3	42.9	-	-	-	-	7
Vacuum/ Forceps	381	70.8	12	2.2	68	12.6	74	13.8	-	-	3	0.6	538
Total	27751	74.8	834	2.2	3166	8.5	5096	13.7	35	0.1	238	0.6	37120

TABLE 9.08: TYPE OF DELIVERY-OUTCOME OF LAST PREGNANCY

Outcome of Last Preg.	Spont.vaginal No.	Rate%	Breech No.	Rate%	Vacuum/Forceps No.	Rate%	LSCS No.	Rate%	Destructive No.	Rate%	Others No.	Rate%	Total
No Prev. Pregnancy	10818	69.7	336	2.2	2114	13.6	2157	13.9	15	0.1	84	0.5	15524
Abortion	2152	71.4	65	2.2	246	8.2	538	17.9	2	0.1	10	0.3	3013
Still Birth	466	63.7	29	4.0	57	7.8	173	23.6	-		7	1.0	732
Live Birth	14143	80.8	397	2.3	644	3.7	2163	12.4	17	0.1	134	0.8	17498
N.K.	172		7		105		65		1		3		353
Total	27751	74.8	834	2.2	3166	8.5	5096	13.7	35	0.1	238	0.6	37120

TABLE 9.09: TYPE OF DELIVERY-INTERVAL FROM LAST PREGNANCY TERMINATION TO CONCEPTION

Interval (months)	Spont.vaginal		Breech		Vacuum/Forceps		LSCS		Destructive		Others		Total
	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	No.	Rate%	
No Prev. Pregnancy	10818	69.7	336	2.2	2114	13.6	2157	13.9	15	0.1	84	0.5	15524
≤12	1910	76.1	67	2.6	132	5.3	386	15.4	3	0.1	11	0.4	2509
>12	14868	79.4	420	2.2	796	4.3	2474	13.2	17	0.1	142	0.8	18718
N.K.	155		10		124		79		-		1		369
Total	27751	74.8	833	2.2	3166	8.5	5096	13.7	35	0.1	238	0.6	37120

TABLE 9.10: TYPE OF DELIVERY - PERINATAL OUTCOME

Status at Discharge	Spont. vaginal No.	Rate%	Breech No.	Rate%	Vacuum/Forceps No.	Rate%	LSCS No.	Rate%	Destructive No.	Rate%	Others No.	Rate%	Total
Still Birth	902 (3.25)	65.4	173 (20.74)	12.5	59 (1.86)	4.3	180 (3.53)	13.0	35	2.5	31 (13.03)	2.2	1380 (3.72)
Died in Hospital	464 (1.67)	60.5	75 (8.99)	9.8	59 (1.86)	7.7	144 (2.83)	18.8	-		25 (10.50)	3.2	767 (2.07)
Alive	26385	75.4	586	1.7	3048	8.7	4772	13.6	-		182	0.5	34973
Total	27751	74.8	834	2.2	3166	8.5	5096	13.7	35	0.1	238	0.6	37120

Figures in parentheses are column percentages

MATERNAL MORTALITY

Although safe motherhood is the dictum of today, our high maternal mortality sadly reflects not only the status of our maternity services but also the status of the woman as well. Insufficient antenatal care, inappropriate intrapartum management, lack of proper transport, communications and health education contribute very greatly to the appalling maternal mortality. Inefficient recording system and the paucity of studies on a national level make it difficult to assess the extent of the problem. A nation wide study on maternal mortality was conducted by FOGSI in the late seventies. Although this study reported the maternal mortality and the cause of death, other factors associated with maternal mortality were not available. The comprehensive information collected in this study made it possible to study the factors associated with maternal mortality. Information on maternal deaths was not satisfactory from one of the participating centres. Therefore data from this centre has been excluded from this analysis.

OBSERVATIONS

Cause of death

A total of 133 maternal deaths were reported from among 32812 deliveries giving a maternal mortality rate of 4.05/1000 births in the urban teaching hospitals. Of these 133 maternal deaths, 24 women died from problems related to abortion, 22 women died in the antenatal period and 87 women died during or after delivery.

The major direct causes of maternal mortality were sepsis (17.3%), haemorrhage (12.8%), eclampsia (12.0%) and rupture uterus (8.3%). Other causes like anaesthetic accident, amniotic fluid embolism, pulmonary embolism, obstructed labour etc. contributed to another 8.3% of maternal deaths. Of 23 women who died of sepsis, 16 women died due to septic abortion remaining 7 women died due to intrapartum or postpartum sepsis. Of the 17 deaths due to haemorrhage, 2 deaths were in abortion cases, of which one was due to bleeding in the case of incomplete abortion and the other was a case of ruptured ectopic pregnancy, 9 cases of death due to haemorrhage were due to APH, of which one woman died before delivery. Remaining 6 women died due to PPH.

There were 16 women who died due to eclampsia and all of them died during or after delivery. There were 11 cases of rupture uterus. Among the indirect causes of maternal mortality, hepatitis (15.8%), anaemia (7.5%) and heart disease (6.0%) were the commonest causes. Other causes included malignancy, encephalitis, pneumonia, bronchial asthma etc. Most of the women who died due to indirect causes died during the antenatal period. In antenatal cases except for one case of APH, one case of intrapartum sepsis and one case of amniotic fluid embolism, all the other deaths were due to indirect causes (Table 10.01).

There were 21 deaths due to hepatitis, of which 10 women died during the antenatal period. Of these 10 women, 7 were admitted in hepatic coma and all these women died within 2 days of admission. One woman with hepatitis died after abortion. Remaining 10 women died after delivery.

Of the 8 women who died due to heart disease, 2 women died during antenatal period. Both were admitted with decompensated heart disease. One woman with heart disease died after abortion and remaining 5 women died during delivery.

Anaemia was the cause of death in 10 women. Three of these cases who died during antenatal period had congestive cardiac failure. One death due to anaemia was in an abortion case and six women died during delivery.

Some of the demographic and obstetric factors associated with maternal deaths were studied.

Residence

Women who came to the hospital from the cities had a maternal mortality rate of 2.47 per 1000 deliveries compared to maternal mortality rate of 19.52 per 1000 deliveries in the women coming from villages. It was 3.75 per 1000 deliveries in women from slums and 3.19 per 1000 deliveries in women from towns. It may be noted that 14 women out of the 22 women who died during antenatal period came from the cities. Hepatitis was the cause of death in 10 of these women. In contrast, 12 of the 24 women who died due to abortion related problems came from villages (Table 10.02).

Age

The maternal death rate was highest in women 35 years or above (14.04 per 1000 deliveries) and least in the 20-34 years age group (3.42/1000 deliveries). These differences in maternal death rate due to age were statistically significant ($P<0.001$) (Table 10.02).

Religion

Muslims had a higher maternal death rate (6.10 per 1000 deliveries) as compared to Hindus (3.96 per 1000 deliveries) and women belonging to other religions (2.89 per 1000 deliveries) ($P<0.01$) (Table 10.02).

Education

With regard to education the death rate among illiterate women was 7.80 per 1000 deliveries as compared to 0.76 per 1000 deliveries, in women who had college education. Maternal mortality decreased significantly with increase in education (Table 10.02).

Total No. of pregnancies

The maternal mortality rate was least among women with 1-2 previous pregnancies (3.29 per 1000 deliveries) and highest among women with 3 or more previous pregnancies (7.40%). The maternal mortality among primigravida was 3.77 per 1000 deliveries. Though this seemed to be only slightly higher than among women with 2nd or 3rd pregnancy, it was statistically significant (Table 10.02). On the whole, 8 women out of 22 women who died antenatally, 10 out of 24 women who died of abortion related causes and 34 out of 87 women who died during delivery were primis. This rate was double in women who had 3 or more previous pregnancies.

Type of delivery

The maternal mortality was least in women who had spontaneous vaginal delivery (1.52 per 1000 deliveries). This increased to 2.77 per 1000 deliveries in breech deliveries. The maternal mortality increased further in operative deliveries, the rates

being 4.22 per 1000 deliveries in women who delivered by vacuum or forceps and 8.11 per 1000 deliveries in women who delivered by caesarean section (Table 10.03).

Status of mother and baby at discharge

In 61 percent cases of maternal deaths the outcome of delivery was either still birth or the baby died during hospital stay. Of the babies who were alive at discharge, in 0.1 per cent the mother had died. In 3.7 percent of still births and 1.2 percent of babies who died before discharge, mother had also expired (Table 10.04).

DISCUSSION

The study shows an overall maternal mortality rate (MMR) of 4.05/1000 deliveries or 4.21 per 1000 live births. This is lower than the mortality rate of 7.53 per 1000 deliveries reported by Bhasker Rao in the FOGSI study on maternal mortality[1]. Other reports from various institutions quote maternal mortality rates ranging from 2.24/1000 deliveries to 5.3/1000 deliveries[2,3]. This is in marked contrast to the mortality rates reported from developed countries. A study on maternal mortality in Louisiana reported a maternal mortality of 0.61 per 1000 live births[4].

About 60 percent of maternal deaths were due to direct obstetric causes. Sepsis (17.3%), haemorrhage (12.8%) and eclampsia (12.0%) were the major causes. A more recent study conducted at Madras, also reports that 60 percent deaths were due to direct obstetric causes, but this study showed a very high incidence of haemorrhage (24.0%) as compared to the present study[2].

Among indirect causes of death hepatitis (15.8%), anaemia (7.5%) and heart disease (6.0%) were the commonest causes. Although this study showed hepatitis as the leading cause in indirect obstetric deaths, other Indian studies rank hepatitis after anaemia and heart disease[2,3]

The deaths due to abortions constituted about 18% of all maternal deaths. This is similar to that reported by the FOGSI study[1].

The maternal mortality rate is higher in women below 20 years and 35 years or above. Similar findings are reported elsewhere[5]. This should however not permit us to ignore the fact that for women in peak reproductive period maternal mortality rate was as high as 3.4/1000 deliveries. Nearly 40 percent of the total deaths occurred in primigravida giving a MMR of 3.7 per 1000 deliveries.

With regard to type of delivery, the maternal mortality rate was higher with operative deliveries, it being 8.11 per 1000 deliveries in women delivered by caesarean section as compared to 1.52 per 1000 deliveries in women who delivered spontaneously. This increase in mortality in caesarean deliveries, is probably not only because of the surgery but may also be due to the underlying obstetric condition that led to the surgery.

There has been a lot of debate on the usefulness of hospital MMR as indicators of maternal health in developing countries. It has been argued that one of the reasons for under reporting in developing countries is that many deaths occur outside the hospital, arrive dead and are taken away before registration or take place at home or on the way to the hospital[5]. On the other hand, it has been pointed out that hospital based statistics of maternal mortality may in fact be over estimates of the national maternal mortality, on account of the fact that maternal deaths are less likely to go unreported as compared to births[6]. In addition, large institutions are likely to have more complicated cases and this is particularly the case when access to such institutions is relatively easy. Here, the institutional MMR may be higher than at home. These facts make it inappropriate to claim any reduction in maternal mortality as compared to the large national study on maternal mortality conducted by FOGSI between 1978-1979 referred to earlier. Be that as it may, an institutional MMR of 4.21 per 1000 live births is still very high and all the more worrisome because most of these deaths were preventable. Till such time as the overall recording system in the country improve to an extent possible to give correct estimates of MMR, the institutional MMR will have to be depended upon to at least reflect the magnitude of the problem. Besides, institutional MMR gives important information on the medical causes of death.

As Dr.Fathalla points out, mere emphasis on the terminal medical condition directly responsible for the women's death is in fact an over simplification of the problem[5]. He points out that maternal deaths are more the result of an interplay of socio-economic, reproductive, medical and health service factors and the problem therefore needs to be viewed in this context. To this end therefore, a more intensive effort at various levels of policy, programme, training and research activities need to be directed.

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TABLE 10.01: CAUSES OF MATERNAL DEATHS

Cause	No.	Percent
Direct		
Haemorrhage	17	12.8
Sepsis	23	17.3
Eclampsia	16	12.0
Rupture Uterus	11	8.3
Others(Pulm.embolism,anaesthetic acci.etc.)	11	8.3
Indirect		
Hepatitis	21	15.8
Anaemia	10	7.5
Heart Disease	8	6.0
Malignancies	2	1.5
Others (Encephalitis, pneumonia, etc.)	14	10.5
Total	133	100.0

TABLE 10.02: MATERNAL MORTALITY:DEMOGRAPHIC AND OBSTETRIC FACTORS

		Total Deliveries	No. of Maternal Deaths	Rate /1000
Age	≤ 19	3410	22	6.45
	20-34	28392	97	3.42
	≥ 35	997	14	14.04
	N.K.	13	-	
Residence	City	22229	55	2.47
	Slum	4803	18	3.75
	Town	3139	10	3.19
	Village	2562	50	19.52
	N.R.	79	-	-
Religion	Hindu	29809	118	3.96
	Muslim	1966	12	6.10
	Others	1037	3	2.89
Education	Nil	8587	67	7.80
	Primary	9145	39	4.26
	Higher Sec.	11157	23	2.06
	College	3923	3	0.76
Total No.of Pregnancies	0	13778	52	3.77
	1-2	14576	48	3.29
	≥ 3	4458	33	7.40
Total Deliveries		32812	133	4.05

TABLE 10.03: MATERNAL DEATHS BY TYPE OF DELIVERY

Type of Delivery	Total Deliveries	No. of Maternal Deaths	Rates/1000
Spontaneous Vaginal	25032	38	1.52
Breech	721	2	2.77
Vacuum/Forceps	2842	12	4.22
LSCS	3972	35	8.11
Destructive	31	-	-
Others	214	-	-
Total	**32812**	**87**	**2.65**

TABLE 10.04: STATUS OF MOTHER AND BABY AT DISCHARGE

Status of Baby	Total Deliveries	Status of Mother Alive	Died	Rate/1000
Alive	30898	30864	34	1.10
Still Birth	1221 (37.2)	1176 (35.9)	45 (517.2)	36.86
Died in Hospital	693 (21.1)	685 (20.9)	8 (91.9)	11.54
Total	**32812**	**32725**	**87**	**2.65**

Figures in parentheses are Rate/1000 columnwise

SUMMARY

This study was conducted by Indian Council of Medical Research in 1982-83 at 10 teaching hospitals situated in various parts of the country. The objective of the study was to find the incidence of various complications of pregnancy in patients admitted to urban hospitals during pregnancy and the effect of these complications on the outcome of pregnancy and survival of mother and child. The study sample comprised of all women admitted to the participating hospitals for reasons pertaining to pregnancy including complications of abortion, during the study period.

A total of 43550 women were enrolled, amounting to 45680 admissions, as many women were admitted during antenatal period and again for delivery.

Medical complications were present in 5.9 percent of admissions which included anaemia (2.97%), Heart disease (0.86%), Hepatitis (0.30%), Urinary tract infection (0.27%), Diabetes (0.28%) and other reasons like malaria, fevers, respiratory infections, etc. (1.20%).There were 4134 admissions for abortion related problems (9.05% of total admissions and 9.5% of total pregnancies). Abortion admissions included 75.3 percent cases of inevitable abortion, 12.3 percent threatened abortions, 3.5 percent missed abortions, 4.7 percent septic, 2.2 percent vesicular moles and 2.2 percent ectopic pregnancies.

Risk of any pregnancy terminating in an abortion was maximum for women above 34 years of age (40.1%) and minimum in the age group 20-34 years (8.9%). This was also significantly higher for young teenagers ($\leq$16) (15.8%) and for girls 17-19 years (10.8%) as compared to women 20-34 years of age. Abortion rate was significantly higher among illiterate women and labourers.

Risk of abortion increased significantly with increase in parity (8.8% for 1st or 2nd pregnancy to 21.1% for women with parity more than 5). Women with history of abortion, spontaneous or induced were also at higher risk. Short interpregnancy interval ($<$ one year) was also associated with higher abortion rate.

Overall rate of septic abortion was 4.7 percent of total abortion and 0.44 percent of total pregnancies. Risk of sepsis in abortion was found to be significantly higher among very young ($\leq$16) and in elderly women ($\geq$35 years) (13.0 and 11.6 percent of abortion cases). Rate of septic abortions was minimum in women 20-34 years of age (3.7%) Incidence of septic abortion decreased significantly from 7.0 percent to 0.5 percent with increase in education upto college level. Sepsis was significantly higher in women working as labourers.

Higher parity was also found to be an attributable factor to higher incidence of septic abortions (3.5 percent for women with parity 1-2 increased to 10.5 percent for women with parity >5). However history of spontaneous abortion did not show any bearing to occurence of septic abortion.

Maternal mortality was 5.8 per 1000 abortions (24 deaths) of which 66.7 percent were due to septic abortions (16 deaths) giving a mortality rate of 8.3% for septic abortions. Abortion deaths accounted for 18.0 percent of total maternal deaths (133) in this study.

Other obstetric reasons for admission to hospital included, hypertensive disorders (7.90%), Rh-ve (0.95%), cervical incompetence (0.44%), intrauterine death (1.25%), malpresentation (2.91%), intrauterine growth retardation (1.05%), prolonged/obstructed labour (0.39%), others (10.65%).

There were 37120 women who delivered in the hospital during the study period. Outcome of delivery was live birth in 35740 (96.3%) and still birth in 1380 (3.7%). In addition 767 neonates (2.1%) died during hospital stay bringing total perinatal loss to 5.8 percent.

Women coming from rural areas showed highest rate of still births (7.8%) followed by urban slums (4.1%).

Risk of still birth was almost 3 times in women 35 years of age or more (9.7%) compared to women below 35 years. Still birth rate decreased significantly with increase in education level of mother and father. This was reflected by nature of work as among labourers still birth rate was 6.0 percent compared

to 3.0 percent in women in service or regular job. Consumption of tobacco was also found to be a contributing factor with a high still birth rate (5.0%).

Multiparous women and women with history of still birth had a higher risk of a still birth in this pregnancy too. Women who had received some antenatal care had lower incidence of still birth (2.5%). The early neonatal deaths were higher in women from rural areas and urban slums. It was also higher in illiterate women and women 35 years or older. Higher parity, history of still births or neonatal death, low birth weight and no antenatal care were also seen to be contributing factors to higher perinatal loss (including still births). Almost 80 percent of neonates who expired before discharge from hospital were low birth weight (<2500 gms.) of which 64.3 percent weighed less than 2000 gms. Similar findings were observed for still births too. Rate of still births and early neonatal deaths decreased significantly with increase in the neonate's weight.

The overall incidence of low birth weight in this study was 26.0 percent. Birth weight was also studied in relation to various demographic and obstetric factors. Mothers' age of 20 years or less or 35 years or more, illiteracy of both mother and father, occupation as labourers were associated with low birth weight. It was observed that low birth weight of 2250 gms. was significantly higher in women with history of abortion and short inter birth interval (<12 months) but no such differences were observed for babies weighing between 2250-2499 gms. In fact for almost all factors that appear to be attributing to low birth weight, the effect was seen to be more apparent on birth weight below 2250 gms. than for babies weighing 2250-2499 gms.

In relation to various complications of pregnancy it was observed that premature labour was the major cause of low birth weight (86.7% <2500 gms, 77%<2250 gms.) and therefore lead to higher perinatal loss. Other complications attributing to low birth weight and perinatal loss were antepartum haemorrhage hypertensive disorders, anaemia, malpresentation and hepatitis. There were 17 maternal deaths (12.8%) due to haemorrhage. Out of this 2 were in abortion cases. There were 9 maternal deaths due to antepartum haemorrhage (15.3/1000 deliveries).

Maternal mortality due to hypertensive disorders of pregnancy was 7.8/1000 deliveries. Of maternal deaths in HDP cases, 16 were due to eclampsia (maternal mortality of 8.6% in eclampsia).

Overall maternal mortality in this study was seen to be 4.05 per 1000 deliveries or 4.21 per 1000 live births. Direct causes like haemorrhage, sepsis, eclampsia, rupture uterus, pulmonary embolism, were responsible for 58.7 percent maternal deaths and in remaining 41.3 percent causes of death included hepatitis, anaemia, heart disease, malignancies, encephalitis, etc. Maternal mortality rate was significantly higher among women aged more than 34 years, illiterate and parity more than five. Maternal mortality was 8.11 per 1000 deliveries among caesarean sections compared to 1.52 for spontaneous vaginal deliveries.

In brief, age above 34 years, parity more than 5, bad obstetric history and complications of pregnancy like antepartum haemorrhage, hypertensive disorders, premature labour etc. were found to be risk factors for perinatal loss. Hypertensive disorders were observed to be higher among, better educated, service class women, coming from towns, unlike other complications which were seen to be higher among women coming from rural areas, illiterate or working as labourers. In terms of pregnancy outcome, women coming from towns, age group 20-34 years with 2nd or 3rd pregnancy, educated and pregnancies well spaced showed very favourable results.

The study brings out the importance of not only the obstetric and medical factors responsible for maternal mortality and perinatal mortality but also the tremendous impact of demographic factors as well as educational and social status of women.

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